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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

September 1999

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700

Figure	Parameter Plotted	Layer (hPa)
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed ($\mathrm{m\ s^{-1}}$).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 $\mathrm{m\ s^{-1}}$ (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|
≥ 4 hPa (pressure),
≥ 5 $\mathrm{m\ s^{-1}}$ (wind speed),
≥ 30 degrees (direction).

2.SD
≥ 6 hPa (pressure),
≥ 80 degrees (direction).

3.PGE ≥ 25

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $\mathrm{m\ s^{-1}}$

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
CGDS	ALL	P	SUR	101	0	0	2.2	5.0	5.4
ELVI2	ALL	P	SUR	37	0	0	1.5	-5.3	5.5
FNCI	ALL	P	SUR	56	0	0	0.9	-4.3	4.4
OZBW6	ALL	P	SUR	66	0	0	1.4	-4.3	4.5
OZLB	ALL	P	SUR	44	0	0	0.9	-4.7	4.7
PCCQ	ALL	P	SUR	73	0	0	0.8	-6.5	6.6
P3YS5	ALL	P	SUR	70	0	0	1.5	4.0	4.2
UAIS	ALL	P	SUR	44	0	0	1.4	-9.9	10.0
UAJS	ALL	P	SUR	97	0	0	1.6	-4.7	4.9
UBDA	ALL	P	SUR	24	0	0	3.5	-5.4	6.4
UCAD	ALL	P	SUR	21	0	0	0.9	-5.4	5.5
UCJB	ALL	P	SUR	21	1	5	1.6	-5.0	5.2
VCRQ	ALL	P	SUR	56	55	98	0.0	-14.4	14.4
VCTV	ALL	P	SUR	26	0	0	3.2	4.5	5.6
VGJC	ALL	P	SUR	20	12	60	4.3	-8.6	9.6
VYNG	ALL	P	SUR	33	32	97	0.0	14.2	14.2
V2XM	ALL	P	SUR	21	0	0	1.5	-4.3	4.5
V2XO	ALL	P	SUR	43	0	0	2.3	-4.3	4.8
V7BA6	ALL	P	SUR	21	0	0	0.9	12.3	12.3
V7BB2	ALL	P	SUR	22	22	100			
WDZB	ALL	P	SUR	37	0	0	1.0	-5.7	5.8
ZCAM9	ALL	P	SUR	63	4	6	2.0	11.8	11.9
48101	ALL	P	SUR	579	579	100			
48102	ALL	P	SUR	123	83	67	0.9	-0.1	0.9
48111	ALL	P	SUR	140	87	62	1.5	0.0	1.5
62142	ALL	P	SUR	647	0	0	0.8	4.3	4.4
9MCU4	ALL	P	SUR	40	0	0	3.0	6.7	7.3
WIND SPEED									
C6NI3	ALL	SPEED	SUR	34	0	0	4.7	7.6	9.0
ELTZ2	ALL	SPEED	SUR	52	0	0	4.8	6.0	7.7
ELWC6	ALL	SPEED	SUR	57	0	0	5.3	8.9	10.4
FNRS	ALL	SPEED	SUR	21	0	0	4.9	9.2	10.4
MXSD6	ALL	SPEED	SUR	24	0	0	5.9	9.5	11.1
MZFK4	ALL	SPEED	SUR	36	0	0	4.8	9.2	10.4
PCCY	ALL	SPEED	SUR	26	0	0	5.9	6.3	8.7
PPXI	ALL	SPEED	SUR	27	0	0	4.6	6.3	7.8
SXYY	ALL	SPEED	SUR	39	0	0	5.6	7.5	9.3
VRUU4	ALL	SPEED	SUR	55	0	0	4.8	5.3	7.2
3FTW	ALL	SPEED	SUR	62	0	0	2.9	6.8	7.4
3FWM4	ALL	SPEED	SUR	74	0	0	2.9	6.3	7.0
WIND DIRECTION									
MXWJ5	ALL	DIRN.	SUR	22	0	0	68.5	-43.9	81.3
VSBU3	ALL	DIRN.	SUR	25	0	0	97.0	50.8	109.5
51307	ALL	DIRN.	SUR	55	0	0	16.5	-32.4	36.4
9VJS	ALL	DIRN.	SUR	33	0	0	24.8	36.0	43.7

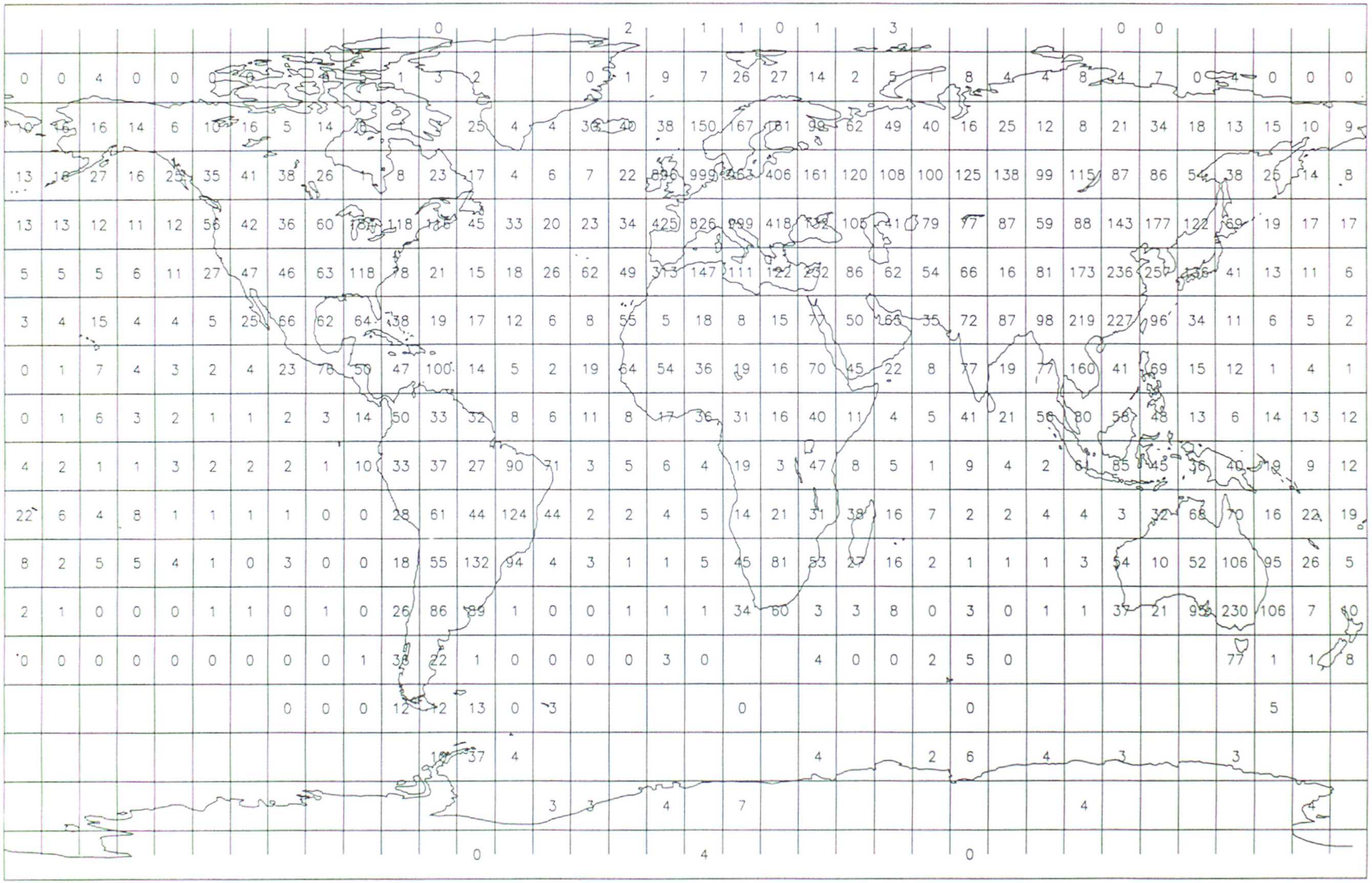
AVAILABILITY – SHIP/SYNOP – SEPTEMBER 1999

FIGURE 1

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 21088



											0					2		1	1	0	1		3						0	0					
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10	16	16	14	6	10	16	5	14	[illegible]	1	[illegible]	25	4	4	36	40	38	150	167	181	99	62	49	40	16	25	12	8	21	34	18	13	15	10	9
13	18	27	16	25	35	41	38	26	1	8	23	17	4	6	7	22	836	999	263	406	161	120	108	100	125	138	99	115	87	86	54	38	25	14	8
13	13	12	11	12	56	42	36	60	184	118	116	45	33	20	23	34	425	826	999	418	132	105	41	79	77	87	59	88	143	177	122	69	19	17	17
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4	2	1	1	3	2	2	2	1	10	33	37	27	90	71	3	5	6	4	19	3	47	8	5	1	9	4	2	61	85	45	36	40	19	9	12
22	6	4	8	1	1	1	1	0	0	28	61	44	124	44	2	2	4	5	14	21	31	38	16	7	2	2	4	4	3	32	68	70	16	22	19
8	2	5	5	4	1	0	3	0	0	18	55	132	94	4	3	1	1	5	45	81	53	27	16	2	1	1	1	3	54	10	52	106	95	26	5
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0	0	0	0	0	0	0	0	0	1	38	22	1	0	0	0	0	3	0			4	0	0	2	5	0						77	1	1	8
							0	0	0	12	12	13	0	3					0						0								5		
											18	37	4								4			2	6		4		3			3			
														3	3		4		7									4						4	
												0						4							0										

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.|bias| ≥ 4 hPa (pressure),
≥ 5 m s^{-1} (wind speed),
≥ 30 degrees (direction).

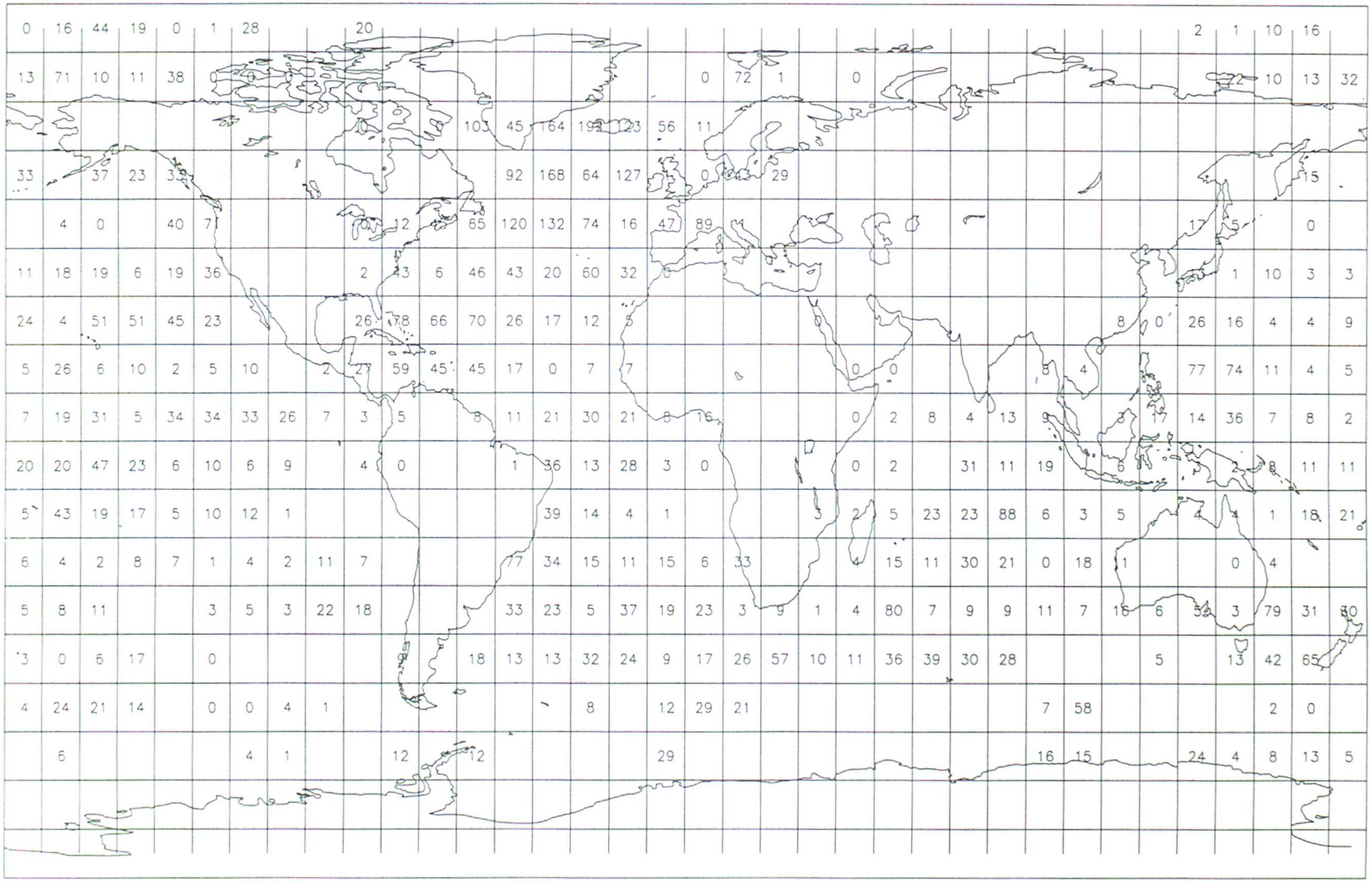
2.SD ≥ 6 hPa (pressure),
≥ 80 degrees (direction).

3.PGE ≥ 25.

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
33946	-48.7	-50.7	ALL	P	SUR	322	88	27	8.8	-1.4	8.9
33948	-39.9	-16.1	ALL	P	SUR	47	35	74	2.2	-11.7	11.9
34913	-33.3	-80.3	ALL	P	SUR	186	0	0	2.0	4.2	4.6
41852	35.3	-71.6	ALL	P	SUR	263	71	27	4.7	-0.4	4.7
46925	25.8	-144.5	ALL	P	SUR	68	0	0	1.3	-5.3	5.4
52649	12.1	142.4	ALL	P	SUR	329	0	0	6.6	-6.7	9.4
54923	-26.8	-90.5	ALL	P	SUR	202	0	0	0.9	-4.3	4.4
61533	47.9	-3.0	ALL	P	SUR	55	55	100			
73510	-65.9	157.0	ALL	P	SUR	242	136	56	5.5	-0.5	5.6
WIND SPEED											
41524	14.7	-62.3	ALL	SPEED	SUR	211	0	0	5.8	7.3	9.4
WIND DIRECTION											
41638	24.4	-49.7	ALL	DIRN.	SUR	59	0	0	18.4	69.3	71.7
55587	-43.7	168.0	ALL	DIRN.	SUR	376	0	0	35.0	48.1	59.5

AVAILABILITY – DRIFTER – SEPTEMBER 1999 FIGURE 2
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 6866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11 18 19 6 19 36 2 43 6 46 43 20 60 32 0 1 10 3 3
24 4 51 51 45 23 26 78 66 70 26 17 12 5 8 0 26 16 4 4 9
5 26 6 10 2 5 10 2 27 59 45 45 17 0 7 7 0 0 8 4 77 74 11 4 5
7 19 31 5 34 34 33 26 7 3 5 8 11 21 30 21 8 16 0 2 8 4 13 9 3 17 14 36 7 8 2
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5 43 19 17 5 10 12 1 39 14 4 1 3 2 5 23 23 88 6 3 5 4 4 1 18 21
6 4 2 8 7 1 4 2 11 7 77 34 15 11 15 6 33 4 15 11 30 21 0 18 11 0 4
5 8 11 3 5 3 22 18 33 23 5 37 19 23 3 9 1 4 80 7 9 9 11 7 16 6 53 3 79 31 30
3 0 6 17 0 9 18 13 13 32 24 9 17 26 57 10 11 36 39 30 28 5 13 42 65
4 24 21 14 0 0 4 1 8 12 29 21 7 58 2 0
6 4 1 12 12 29 16 15 24 4 8 13 5

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60010	28.3N	16.5W	2367	S7	57	0	0	37	2.0	-5.5	5.9
60445	36.2N	5.4E	1081	S8	82	0	0	1	1.2	4.9	5.0
60468	35.6N	6.2E	1052	S8	80	79	99	0	0.0	-1.6	1.6
60511	35.3N	1.4E	1127	S8	82	59	72	0	0.5	14.4	14.4
60535	34.7N	3.3E	1144	S8	64	0	0	2	1.6	-4.9	5.2
60670	24.6N	9.5E	1054	S8	69	0	0	0	0.6	9.3	9.3
63330	13.5N	39.5E	2070	S	46	45	98	0	0.0	-8.5	8.5
63333	11.1N	39.7E	1903	MS	73	0	0	30	0.8	4.0	4.1
63334	10.3N	37.7E	2515	MS	67	1	1	1	1.1	10.4	10.5
63402	7.7N	36.8E	1725	MS	89	0	0	0	1.0	6.8	6.9
63450	9.0N	38.8E	2354	MS	76	0	0	0	0.6	4.1	4.1
63471	9.6N	41.9E	1260	MS	87	0	0	0	0.6	9.6	9.6
63478	5.9N	43.6E	295	MS	50	0	0	0	0.8	6.7	6.7
68030	18.5S	25.6E	1071	8	25	0	0	8	1.0	4.4	4.5
68396	26.5S	31.3E	641	S8	54	0	0	0	1.0	4.6	4.7

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30320	56.9N	105.7E	669	MS	99	48	48	0	1.4	0.7	1.6
38069	44.2N	66.8E	153	M	76	0	0	0	1.0	-7.2	7.3
40743	36.2N	57.7E	941	M	111	0	0	0	0.9	-5.0	5.1
40762	35.3N	59.2E	1333	MS	110	11	10	0	1.1	-13.0	13.0
41254	23.1N	57.7E	1755	S8	58	58	100	0			
41396	16.0N	48.9E	700	MS	40	0	0	0	0.9	6.0	6.1
41466	13.7N	44.1E	1402	8	43	1	2	77	0.7	-5.5	5.5
44416	28.6N	81.6E	720	MS	66	0	0	2	1.6	4.8	5.1
44477	27.0N	87.4E	1445	S8	67	67	100	0			
47022	40.8N	128.2E	1200	S	61	1	2	3	1.7	4.2	4.5
51495	43.5N	91.6E	874	M	118	0	0	1	1.5	7.8	7.9
52955	35.6N	100.8E	3201	S	118	4	3	0	0.6	13.4	13.4
53588	39.0N	113.5E	2898	S	117	117	100	0			
54587	39.1N	123.2E	35	M	105	0	0	1	1.3	-4.1	4.3
56287	30.0N	103.0E	629	M	118	0	0	3	1.1	4.1	4.2
56385	29.5N	103.3E	3049	S	118	0	0	3	0.9	-4.3	4.4
56444	28.5N	98.9E	3488	S	116	12	10	0	0.5	14.1	14.1
56462	29.0N	101.5E	2994	S	115	0	0	0	1.0	9.5	9.6

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	41	0	0	0	1.2	-5.5	5.6
82326	3.8S	62.1W	48	MS	86	0	0	10	1.8	4.5	4.8
82586	5.2S	39.3W	212	MS	85	0	0	2	0.8	-4.2	4.3
83214	10.3S	54.9W	285	MS	69	0	0	6	2.5	-6.4	6.9
83235	12.4S	46.4W	604	MS	86	0	0	0	1.0	6.4	6.5
83319	14.7S	52.4W	315	MS	80	0	0	1	1.3	-4.4	4.6
83332	14.1S	46.4W	826	MS	86	18	21	0	0.6	13.8	13.8
83408	14.3S	43.8W	447	MS	82	1	1	1	1.3	10.2	10.3
83423	16.7S	49.3W	741	MS	86	0	0	0	1.0	-4.5	4.6
83488	17.8S	42.9W	1097	MS	83	83	100	0			
83531	18.6S	46.5W	940	MS	83	0	0	0	1.0	-6.8	6.9
83587	19.9S	43.9W	850	MS	84	0	0	1	1.1	-7.0	7.1
83773	23.1S	48.9W	793	S	43	0	0	0	1.0	-10.4	10.4
83836	25.5S	50.6W	837	MS	86	0	0	0	0.9	-4.7	4.8
84401	5.2S	80.6W	49	MS	82	0	0	0	1.1	5.7	5.8
84425	5.9S	76.1W	179	MS	38	0	0	0	1.1	4.4	4.5
84455	6.5S	76.4W	281	MS	59	0	0	0	1.5	5.5	5.7
84472	7.1S	78.5W	2620	S	39	1	3	3	0.8	-5.9	6.0
84501	8.1S	79.0W	26	MS	85	0	0	0	1.0	4.6	4.7
84686	13.6S	72.0W	3248	S	81	0	0	0	1.1	-5.5	5.6

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
84720	14.9S	75.0W	567	MS	56	0	0	2	1.5	6.1	6.3
84782	18.1S	70.3W	468	MS	88	0	0	1	1.2	9.0	9.1
85312	19.8S	63.9W	992	S	43	1	2	0	1.5	-11.2	11.3
85406	18.3S	70.3W	55	M	115	0	0	0	0.8	6.2	6.3
85418	20.5S	70.2W	48	M	115	0	0	0	0.7	4.0	4.1
85432	22.5S	68.9W	2320	S8	77	0	0	0	0.7	5.1	5.1
85836	43.6S	71.8W	277	M	41	0	0	0	1.7	4.1	4.4

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
72376	36.8N	108.2W	1677	M	107	0	0	0	1.4	7.1	7.2
76118	30.4N	109.7W	1040	MS	41	1	2	5	1.2	-9.2	9.3
76632	20.1N	98.7W	2417	MS	33	1	3	0	0.5	-5.3	5.3
76658	19.2N	103.7W	494	MS	45	0	0	0	1.0	6.8	6.9
76750	18.5N	88.3W	9	MS	109	0	0	1	1.5	-8.1	8.2
76773	17.8N	97.8W	1680	MS	22	0	0	0	0.7	7.9	7.9
76775	17.1N	96.7W	1550	MS	71	0	0	0	0.7	4.1	4.2
76845	16.7N	92.6W	2276	MS	103	103	100	0			
78718	14.4N	87.6W	626	MS	57	44	77	0	0.5	-14.5	14.5

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
91163	21.9N	159.6W	7	8	343	343	100	0			
92010	6.1S	145.4E	1587	M	46	0	0	100	0.6	8.0	8.0
92068	10.0S	149.4E	1005	MS	45	1	2	22	1.7	-4.2	4.5
95909	36.5S	148.3E	1957	MS	115	115	100	0			
96751	6.7S	106.9E	920	S8	35	2	6	3	1.3	-4.5	4.7

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01360	61.9N	7.9E	712	MS	115	1	1	1	1.1	5.6	5.7
04416	72.6N	38.4W	3202	S	24	7	29	8	1.3	-2.6	2.9
11343	47.1N	13.0E	3105	S	97	0	0	2	1.2	-4.0	4.2
13593	41.3N	22.4E	1031	8	70	1	1	7	1.0	-4.6	4.7
16227	41.9N	13.6E	655	MS	346	345	100	0			
17042	41.4N	41.4E	33	M	90	0	0	0	1.1	4.3	4.4
17092	39.8N	39.5E	1218	S8	118	0	0	0	1.3	6.7	6.8

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89108	89.0S	1.0W	2755	S	153	0	0	0	1.6	5.4	5.6
89272	75.0S	70.8W	1395	S	244	82	34	0	1.8	-12.5	12.6
89744	74.0S	43.0E	3353	S	265	0	0	0	1.1	9.0	9.1
89774	73.4S	76.8E	2563	S	263	0	0	0	1.7	5.8	6.0
89816	66.8S	112.8E	1375	S	227	0	0	0	2.3	-4.6	5.1

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

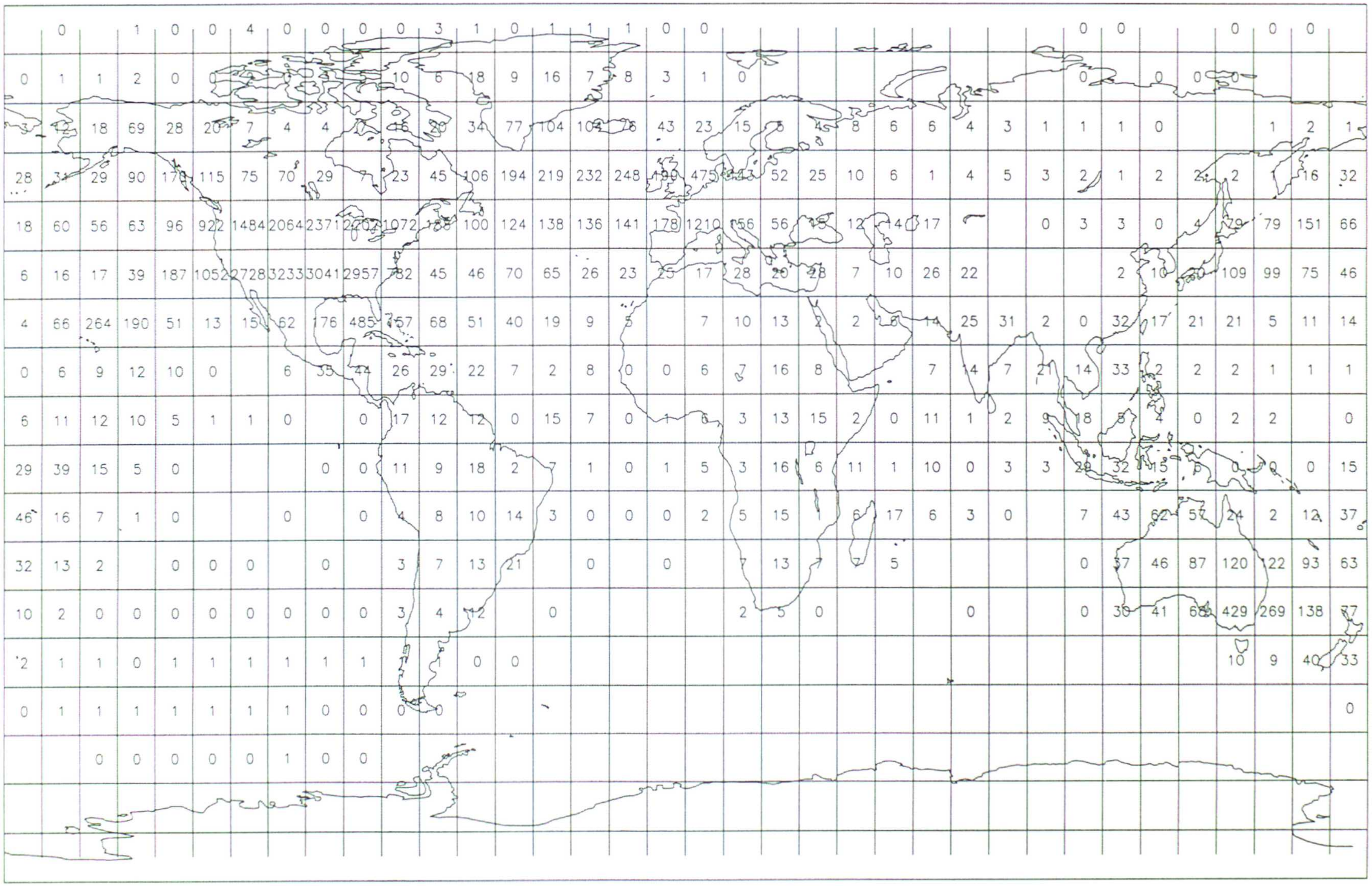
NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	69	0	35	1.3	0.3	69	0	35	0	5.8	0.8
AAH	102	2	15	1.1	0.1	111	0	17	0	8.3	1.1
AAL	6117	0	15	1.6	0.2	6073	0	16	0	8.7	1.1
AAR	1910	1	7	1.6	-0.6	1879	0	8	0	8.0	0.3
ACA	2197	0	3	1.7	-0.1	2219	0	3	0	7.8	0.7
ACI	68	18	56	2.0	1.0	56	0	45	0	11.0	2.4
AEA	513	1	4	2.3	1.3	468	0	4	0	7.9	1.4
AEL	751	6	17	2.3	0.1	759	0	12	0	9.5	1.2
AEY	46	4	11	1.4	1.1	46	0	7	0	7.8	2.5
AFL	465	1	4	2.1	0.7	459	1	5	0	7.2	1.2
AFR	1874	2	9	1.8	0.3	1877	0	9	0	8.1	0.9
AIH	359	1	3	1.7	0.3	359	0	3	0	6.3	0.6
AJM	137	0	1	1.3	-0.2	133	0	2	0	7.6	2.0
AMM	81	1	6	1.7	1.2	83	0	6	0	8.5	1.5
AMT	828	1	41	2.4	-0.2	833	0	39	0	6.5	1.1
AMX	338	1	4	1.9	0.3	340	0	7	0	11.8	1.2
ANA	1427	0	6	1.6	-0.2	1405	0	7	0	7.5	0.3
ANZ	4003	2	45	1.6	-0.1	3927	0	44	0	7.3	0.6
AOM	857	2	10	1.9	1.0	854	0	8	0	8.1	1.5
ARG	49	2	33	2.2	0.8	50	0	36	0	12.6	0.8
AVA	641	1	3	1.8	0.5	638	0	5	0	9.5	1.3
AVE	276	1	4	1.8	1.2	273	0	5	0	9.6	2.4
AVN	122	3	36	1.2	0.4	120	0	34	0	8.5	1.1
AXF	62	18	50	1.2	0.0	51	0	39	0	7.9	2.4
AZA	711	4	13	2.6	0.8	706	0	7	0	8.9	0.9
BAF	31	6	29	4.6	2.2	33	0	0	0	6.9	0.4
BAL	411	0	7	1.8	-0.5	406	0	7	0	7.8	1.2
BAW	1864	1	7	1.9	0.0	1848	0	8	0	7.8	1.0
BLX	43	0	0	1.8	-0.6	44	0	2	0	10.2	1.4
BWA	366	1	4	2.1	1.3	361	1	6	0	9.5	2.3
CAL	538	1	6	1.8	0.5	553	0	7	0	9.3	0.3
CCA	291	1	10	2.4	0.5	323	0	15	0	11.9	-0.4
CDN	2510	0	6	1.8	0.2	2506	0	7	0	8.7	0.7
CES	345	1	11	1.8	0.2	353	1	10	0	8.1	-0.1
CFC	25	0	12	2.4	0.2	26	0	12	0	8.9	3.2
CFG	962	0	3	1.7	-0.8	949	1	5	0	7.6	0.8
CKS	411	2	39	2.4	1.4	428	0	38	0	6.0	1.5
CKT	232	0	3	2.0	1.6	211	0	4	0	7.3	1.4
CLX	415	0	5	1.7	-0.3	416	0	7	0	8.7	0.1
CMI	461	0	6	1.6	0.7	438	0	6	0	8.8	2.0
CMM	894	0	7	1.6	0.2	887	0	7	0	6.9	0.5
COA	1572	1	20	1.7	0.3	1575	0	24	0	11.6	1.7
CPA	68	1	9	2.3	0.2	77	0	8	0	10.4	0.4
CRL	530	1	9	1.8	0.9	528	0	9	0	7.3	1.1
CSN	75	1	12	1.9	0.9	77	1	9	0	8.0	0.5
CTB	215	1	1	1.7	-0.1	216	0	3	0	7.6	0.6
CTM	90	1	23	2.8	-0.1	89	0	24	0	7.6	1.5
CUB	525	0	9	2.6	1.3	521	0	9	0	10.5	1.0
DAL	4362	0	27	1.6	0.3	4397	0	28	0	8.2	0.9
DBY	772	1	4	1.4	-0.3	763	0	5	0	8.5	0.7
DLH	2945	0	5	1.9	-0.1	2885	0	6	0	8.1	0.8
EEZ	62	19	21	1.4	0.2	61	0	5	0	8.5	1.3
EIA	369	2	41	1.3	0.5	368	0	42	0	8.9	1.1
EIN	42	0	10	1.8	0.2	42	0	10	0	9.1	0.7
ELY	111	1	6	1.7	0.0	114	0	9	0	10.0	0.9
ETH	46	0	9	1.5	0.4	50	2	12	0	7.9	2.3
EVA	2334	1	4	1.5	-0.3	2335	0	5	0	8.1	0.2
EWW	75	4	7	1.9	0.3	75	0	5	0	9.3	2.6
FDX	1580	1	14	1.6	0.6	1586	1	15	0	8.6	0.8

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FIN	437	0	3	1.9	0.4	426	0	4	0	8.4	0.8
FJI	1257	10	45	1.9	0.6	1130	1	39	0	8.8	0.7
FOM	243	21	54	1.8	-0.4	197	0	41	0	6.7	1.7
FWQ	22	0	50	1.7	0.6	22	0	50	0	8.7	-2.9
GAF	77	1	6	1.8	-0.4	82	0	7	0	9.3	1.2
GCO	66	6	18	2.8	1.2	69	3	19	0	15.2	2.2
GHA	86	1	5	1.5	0.5	86	0	5	0	11.1	1.8
GIA	48	0	21	1.6	0.7	47	0	23	0	5.3	0.8
GTI	228	0	6	2.1	-0.5	231	0	7	0	10.4	0.4
HAL	3335	0	33	1.5	0.5	3304	0	34	0	8.7	1.8
HLF	116	1	9	1.4	-0.4	113	1	11	0	10.7	1.5
HRH	148	22	72	1.8	0.2	119	0	65	0	10.2	1.5
HVN	21	0	14	2.5	0.0	21	0	14	0	5.9	1.0
IBE	3060	1	10	1.9	0.6	2986	0	11	0	8.6	1.2
ICE	1201	0	3	1.7	0.2	1177	0	4	0	7.9	1.1
IWD	263	0	6	1.7	-0.1	257	0	5	0	8.4	2.2
JAL	7866	0	4	1.6	0.3	7792	0	4	0	7.5	0.6
JKK	230	1	7	1.5	0.1	208	0	9	0	10.3	0.4
KAL	4125	1	8	1.6	-0.2	4071	0	9	0	8.4	0.4
KIW	47	13	51	1.9	1.3	41	0	44	0	5.6	1.4
KLM	2674	0	10	1.7	0.5	2662	0	11	0	8.4	0.9
LAN	44	7	27	2.9	0.2	42	2	31	0	17.5	-4.6
LAP	40	0	0	2.4	0.6	40	0	0	0	8.1	1.9
LDA	117	2	14	2.3	-0.5	115	0	11	0	8.2	1.7
LDI	519	6	18	3.1	0.5	523	0	7	0	8.5	1.0
LIB	295	2	5	2.0	1.3	294	0	3	0	7.5	1.5
LOT	287	2	6	2.2	-1.1	281	0	5	0	8.5	0.1
LTU	720	0	4	1.6	-0.1	703	0	4	0	7.9	0.9
LXR	80	0	4	1.7	1.1	79	1	10	0	10.9	3.3
MAH	29	0	0	1.6	-0.9	30	0	0	0	6.8	0.4
MAS	401	1	7	1.8	-0.1	409	0	7	0	8.8	0.6
MON	163	1	3	1.8	0.0	154	2	6	0	8.4	2.4
MPD	551	1	3	1.8	0.7	538	0	3	0	8.4	1.5
MPH	888	0	3	1.8	-0.5	889	0	4	0	8.2	0.6
NCA	661	0	0	1.8	0.0	655	0	2	0	8.3	0.1
NWA	11075	1	8	1.8	0.7	10881	0	9	0	8.2	0.6
OAL	20	0	0	1.6	-0.7	20	0	0	0	8.0	3.8
PAC	288	10	39	3.2	1.4	297	0	28	0	8.4	0.4
PAL	1005	0	2	1.4	-0.2	944	0	3	0	8.3	0.2
PAO	372	15	65	1.4	0.1	317	0	60	0	7.4	1.2
QFA	2028	1	57	1.6	0.2	2003	0	57	0	7.7	0.8
RAF	47	0	4	2.2	1.7	45	2	7	0	8.4	1.0
RAM	40	0	0	1.4	0.2	40	0	0	0	7.1	1.3
RCH	419	3	20	1.9	0.5	385	1	22	0	11.0	1.8
RJA	45	2	7	1.9	-0.6	45	0	9	0	10.1	1.1
RKA	98	0	4	1.8	-0.4	98	0	3	0	7.0	0.8
RON	24	0	42	0.8	0.2	24	0	42	0	5.6	1.5
ROY	243	1	6	1.7	0.0	242	0	5	0	8.4	1.0
RRR	178	0	8	2.0	-0.2	177	1	11	0	8.3	1.2
RYN	453	0	40	1.6	1.1	444	0	40	0	5.1	0.7
RZO	114	0	1	1.4	-0.5	112	1	4	0	8.3	0.9
SAA	234	0	4	1.5	0.0	233	0	4	0	7.4	0.9
SAB	23	0	0	1.6	0.4	24	0	0	0	5.0	0.5
SAS	1662	0	10	1.8	-0.4	1650	0	11	0	8.0	0.4
SIA	687	0	6	1.5	-0.1	694	0	7	0	8.5	0.3
SLR	201	0	54	1.8	-0.6	202	0	8	0	8.5	0.8
SOL	51	4	6	1.3	0.3	48	0	2	0	6.7	0.4
SVA	107	1	5	1.8	-0.1	124	0	9	0	9.3	0.1
SVV	27	4	11	5.1	4.7	27	0	4	0	10.4	2.3

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SWR	85	0	12	1.4	0.2	85	0	14	0	8.8	1.6
TAM	23	4	30	2.0	1.2	23	0	35	0	17.1	5.8
TAP	833	1	8	1.6	0.0	833	0	9	0	9.3	1.7
TBA	29	0	45	2.2	1.6	29	3	48	0	8.2	1.1
THA	533	0	4	1.5	-0.3	527	0	6	0	8.3	0.2
THT	59	2	31	2.3	0.9	59	0	27	0	6.7	1.7
TOW	144	0	6	2.0	0.6	153	0	8	0	9.0	0.9
TPA	40	0	0	1.2	0.4	41	0	2	0	6.1	-0.1
TSC	228	0	4	2.0	0.5	227	0	5	0	8.4	0.6
TWA	1510	0	12	1.7	0.4	1439	0	12	0	8.5	1.3
UAL	94584	0	84	1.2	-0.1	94569	0	84	0	5.7	0.6
UPS	1497	0	26	1.7	0.5	1503	0	26	0	8.0	0.4
USA	331	1	5	1.6	0.0	288	0	5	0	8.1	1.1
VIR	473	1	4	1.6	-0.2	472	0	4	0	7.6	0.9
VKG	38	3	13	1.9	0.1	38	0	11	0	12.4	0.5
VRG	276	2	34	2.2	1.1	281	0	100	0	8.8	1.5
VSP	69	0	30	1.5	1.1	68	0	32	0	8.0	1.2
VVR	70	4	33	2.2	0.7	76	0	29	0	7.2	2.5
WOA	163	1	4	1.5	0.5	168	1	5	0	9.8	1.0
AN	24895	0	1	1.3	0.1	24895	0	1	0	5.7	0.5
AR	2637	0	100	2.9	2.7	2637	0	0	0	6.4	0.7
BA	9013	0	1	1.5	0.6	8979	0	1	0	6.6	0.9
EU	44544	1	13	1.5	0.1	44489	0	12	0	7.0	1.0
IT	563	0	54	1.1	0.2	562	1	54	0	7.0	0.6
KL	6376	0	6	1.5	1.0	6373	0	6	0	6.3	0.8
LH	2051	0	0	1.8	1.3	2053	0	0	0	5.9	0.9
MK	4975	0	42	2.0	1.6	4953	0	1	0	7.6	0.7
NZ	2676	0	2	1.4	-0.3	2676	0	3	0	5.4	0.7
QF	25303	0	3	1.4	0.5	25301	0	3	0	5.7	0.6
SA	3369	0	25	2.3	2.0	3363	0	1	0	6.9	0.9
SK	314	0	0	0.7	0.0	314	0	0	0	4.2	0.3
SV	902	100	100	46.3	-32.8	895	0	100	0	23.3	14.7
WA	302	11	18	1.6	0.5	296	3	27	0	10.9	-1.9
XX	3509	1	7	1.5	0.3	4216	0	48	0	10.7	1.3
N	624	2	18	2.6	0.9	652	0	16	0	9.2	1.1
US ACARS	546929	0	12	1.2	0.3	547705	0	12	0	5.8	0.7

MEAN DAILY COUNT OF AIRCRAFT 70 – 500 HPA FIGURE 3
SEPTEMBER 1999
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED


0 1 0 0 4 0 0 0 0 3 1 0 1 1 1 0 0 0 0 0 0 0
0 1 1 2 0 0 10 6 18 9 16 7 8 3 1 0 0 0 0 0
3 12 18 69 28 20 7 4 4 7 16 20 34 77 104 104 76 43 23 15 5 45 8 6 6 4 3 1 1 1 0 1 2 1
28 31 29 90 178 115 75 70 29 7 23 45 106 194 219 232 248 199 475 443 52 25 10 6 1 4 5 3 2 1 2 2 2 1 16 32
18 60 56 63 96 922 1484 2064 2371 2202 1072 188 100 124 138 136 141 178 1210 156 56 15 12 14 17 0 3 3 0 4 79 79 151 66
6 16 17 39 187 1052 2728 3233 3041 2957 782 45 46 70 65 26 23 25 17 28 20 28 7 10 26 22 2 10 30 109 99 75 46
4 66 264 190 51 13 15 62 176 485 157 68 51 40 19 9 5 7 10 13 2 2 16 14 25 31 2 0 32 17 21 21 5 11 14
0 6 9 12 10 0 6 35 44 26 29 22 7 2 8 0 0 6 7 16 8 7 14 7 21 14 33 2 2 2 1 1 1
6 11 12 10 5 1 1 0 0 17 12 12 0 15 7 0 1 6 3 13 15 2 0 11 1 2 9 18 5 4 0 2 2 0
29 39 15 5 0 0 0 11 9 18 2 7 1 0 1 5 3 16 6 11 1 10 0 3 3 28 32 15 5 0 0 15
46 16 7 1 0 0 0 4 8 10 14 3 0 0 0 2 5 15 1 6 17 6 3 0 7 43 62 57 24 2 12 37
32 13 2 0 0 0 0 3 7 13 21 0 0 7 13 7 7 5 0 37 46 87 120 122 93 63
10 2 0 0 0 0 0 0 0 0 3 4 12 0 2 5 0 0 0 30 41 68 429 269 138 77
2 1 1 0 1 1 1 1 1 1 7 1 0 0 10 9 40 33
0 1 1 1 1 1 1 0 0 0 0 0
0 0 0 0 0 1 0 0

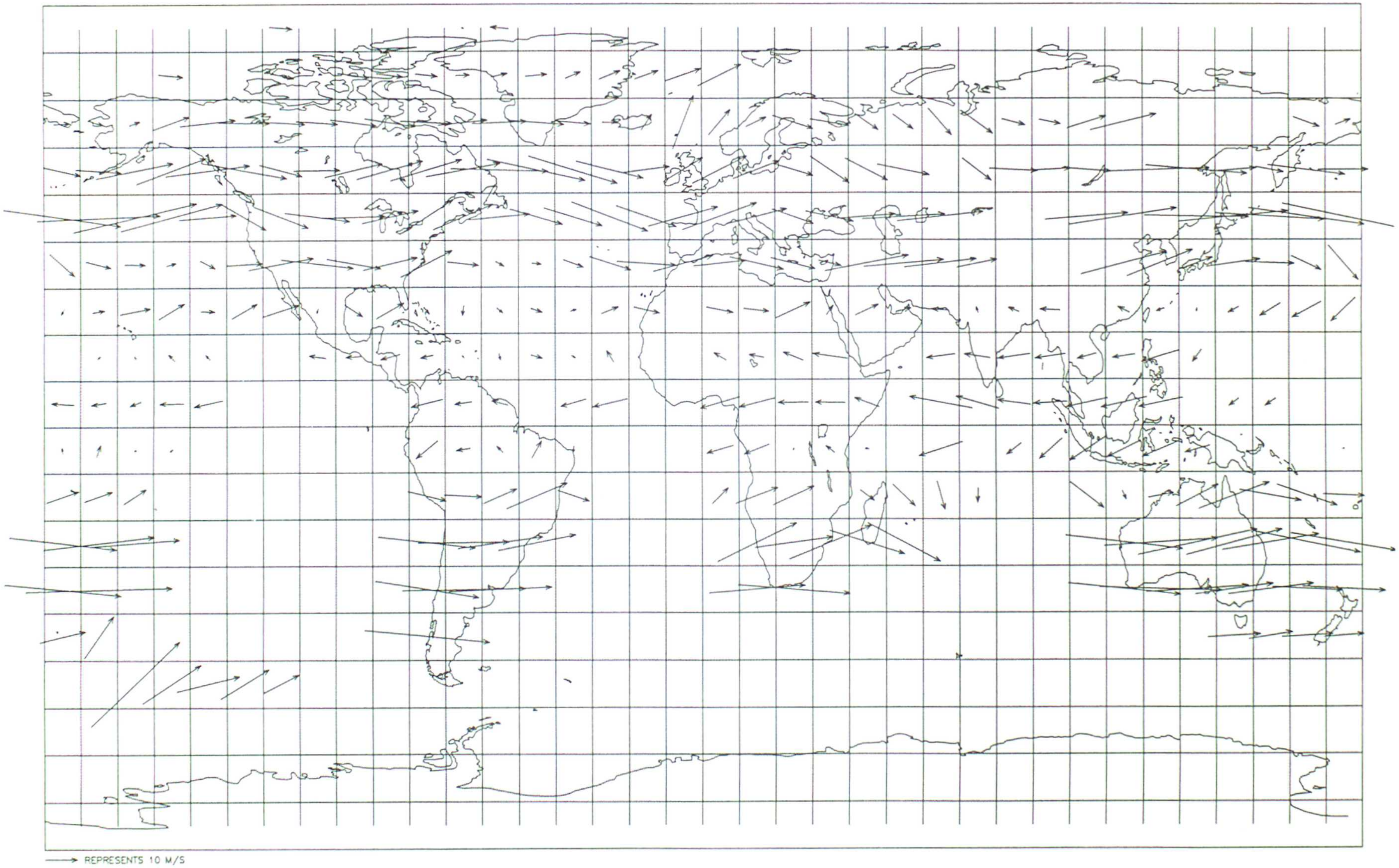
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

FIGURE 4

SEPTEMBER 1999

OBSERVATIONS WITH O−B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



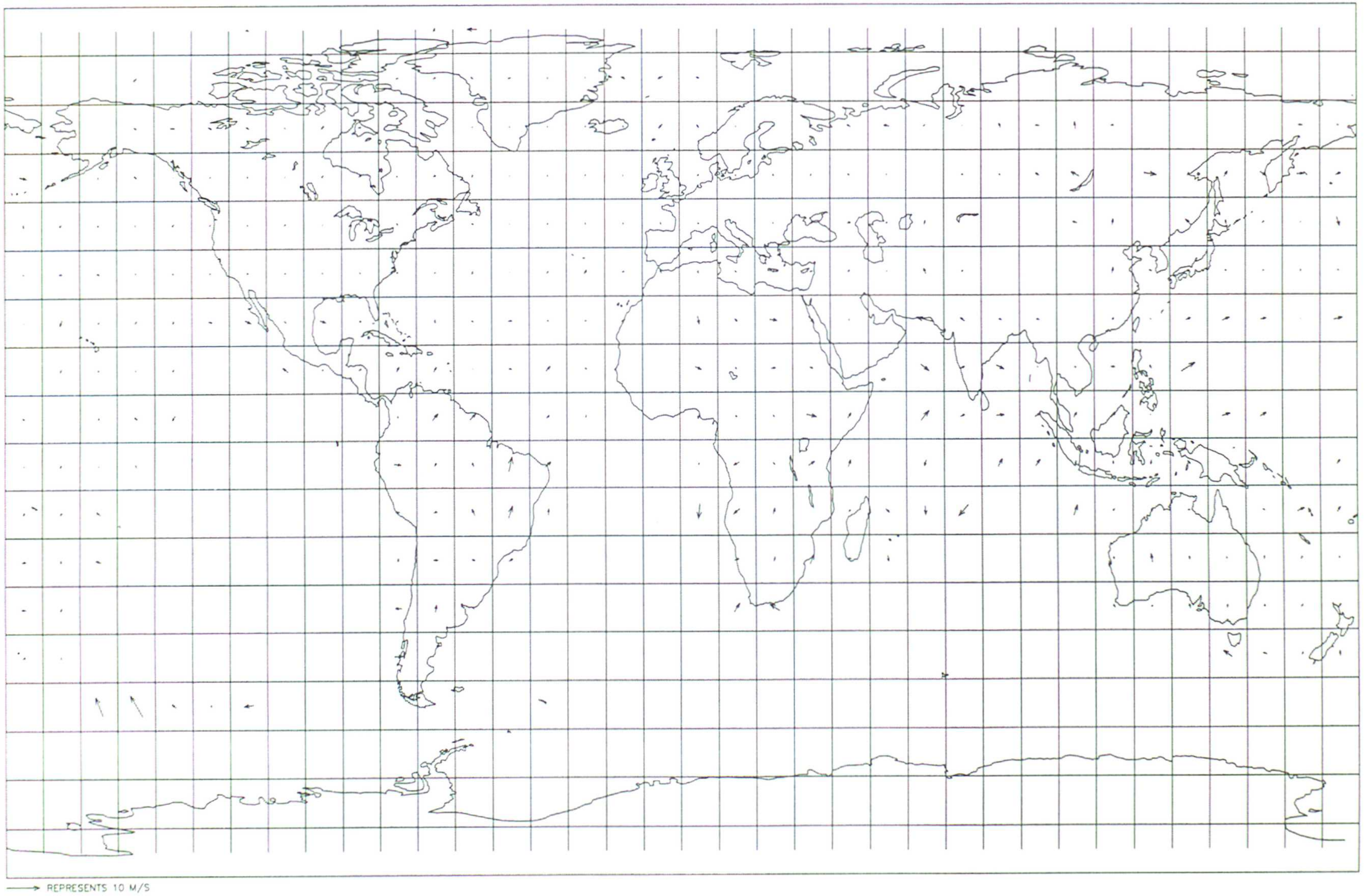
AIRCRAFT MEAN O–B WINDS BETWEEN 70 AND 500 HPA

FIGURE 5

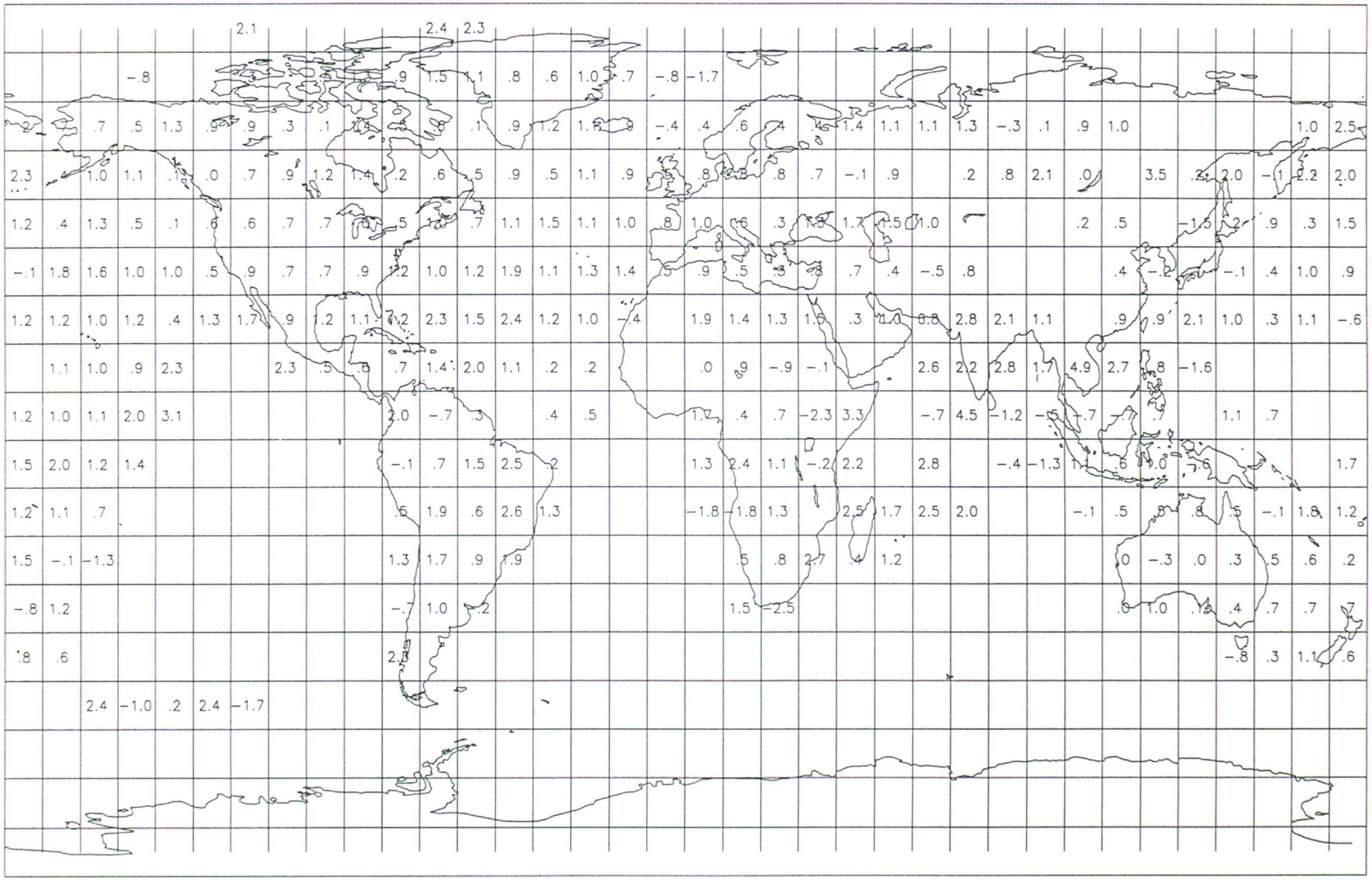
SEPTEMBER 1999

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O-B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
SEPTEMBER 1999
OBSERVATIONS WITH O-B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


2.1 2.4 2.3
-.8 .9 1.5 1.1 .8 .6 1.0 .7 -.8 -1.7
.7 .5 1.3 .9 .9 .3 .1 .1 .9 1.2 1.5 .9 -.4 .4 .6 .4 1.4 1.1 1.1 1.3 -.3 .1 .9 1.0 1.0 2.5
2.3 1.0 1.1 .1 .0 .7 .9 1.2 1.4 .2 .6 .5 .9 .5 1.1 .9 .8 .8 .7 -.1 .9 .2 .8 2.1 .0 3.5 .2 2.0 -.1 2.2 2.0
1.2 .4 1.3 .5 .1 .6 .6 .7 .7 .5 .7 1.1 1.5 1.1 1.0 .8 1.0 .6 .3 1.3 1.7 1.5 1.0 .2 .5 -1.5 .2 .9 .3 1.5
-.1 1.8 1.6 1.0 1.0 .5 .9 .7 .7 .9 1.2 1.0 1.2 1.9 1.1 1.3 1.4 .5 .9 .5 .3 .8 .7 .4 -.5 .8 .4 -.2 -.1 .4 1.0 .9
1.2 1.2 1.0 1.2 .4 1.3 1.7 .9 1.2 1.1 1.2 2.3 1.5 2.4 1.2 1.0 -.4 1.9 1.4 1.3 1.5 .3 1.0 0.8 2.8 2.1 1.1 .9 .9 2.1 1.0 .3 1.1 -.6
1.1 1.0 .9 2.3 2.3 .5 .6 .7 1.4 2.0 1.1 .2 .2 .0 .9 -.9 -.1 2.6 2.2 2.8 1.7 4.9 2.7 .8 -1.6
1.2 1.0 1.1 2.0 3.1 2.0 -.7 .3 .4 .5 1.7 .4 .7 -2.3 3.3 -.7 4.5 -1.2 -.5 -.7 .7 1.1 .7
1.5 2.0 1.2 1.4 -.1 .7 1.5 2.5 .2 1.3 2.4 1.1 -.2 2.2 2.8 -.4 -1.3 .6 1.0 .6 1.7
1.2 1.1 .7 .5 1.9 .6 2.6 1.3 -1.8 -1.8 1.3 2.5 1.7 2.5 2.0 -.1 .5 .8 .8 .5 -.1 1.8 1.2
1.5 -.1 -1.3 1.3 1.7 .9 1.9 .5 .8 2.7 .4 1.2 .0 -.3 .0 .3 .5 .6 .2
-.8 1.2 -.7 1.0 .2 1.5 -2.5 .0 1.0 .1 .4 .7 .7 .7
.8 .6 2.3 -.8 .3 1.1 .6
2.4 -1.0 .2 2.4 -1.7

AIRCRAFT : RMS O−B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
SEPTEMBER 1999
OBSERVATIONS WITH O−B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

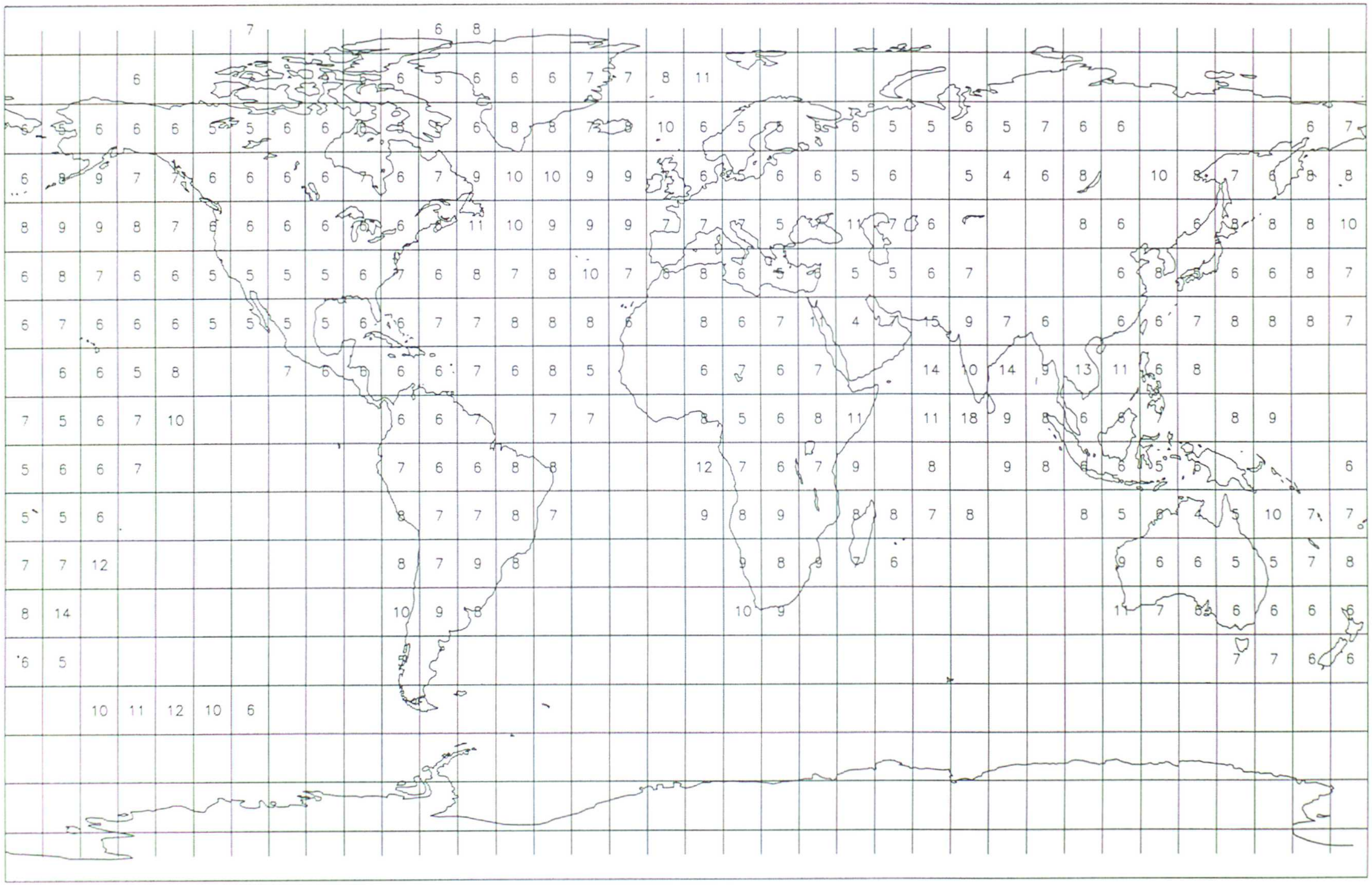


TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
42027	00	Z	150	34/ 75	14	1	109.9	-17.2	111.3	7
42027	12	Z	150	34/ 75	16	0	112.0	70.2	132.1	6
42182	00	Z	150	29/ 77	28	0	92.9	27.7	96.9	4
42182	12	Z	100	29/ 77	20	0	118.6	97.8	153.7	5
42314	00	Z	100	27/ 95	18	1	82.0	109.4	136.7	5
42314	12	Z	150	27/ 95	20	0	107.0	-42.0	115.0	5
42339	00	Z	150	26/ 73	14	0	112.3	113.8	159.9	4
42339	12	Z	250	26/ 73	17	0	91.7	24.6	94.9	6
42361	00	Z	100	26/ 78	17	0	91.4	153.9	179.0	6
42724	00	Z	150	24/ 91	12	1	107.5	19.2	109.1	4
42809	12	Z	150	23/ 88	25	0	89.8	72.8	115.6	5
42971	00	Z	100	20/ 86	19	1	69.3	194.0	206.0	6
42971	12	Z	150	20/ 86	17	0	84.4	92.0	124.9	5
43003	00	Z	100	19/ 73	15	1	68.7	171.5	184.8	5
43003	12	Z	100	19/ 73	5	6	39.4	234.6	237.9	7
43014	12	Z	150	20/ 75	13	0	89.4	110.5	142.2	4
43192	12	Z	100	15/ 74	10	0	128.9	50.0	138.3	4
43285	12	Z	150	13/ 75	13	0	61.8	88.5	107.9	4
43333	00	Z	150	12/ 93	23	0	101.8	22.4	104.2	5
43333	12	Z	100	12/ 93	16	0	127.2	68.8	144.6	4
43369	00	Z	100	8/ 73	22	0	66.1	-107.0	125.8	4
53463	00	Z	1000	41/ 112	29	0	10.7	36.1	37.6	4
53463	12	Z	150	41/ 112	23	0	68.1	68.1	96.3	4
61902	12	Z	200	-8/ -14	12	0	38.2	71.4	81.0	4
84628	12	Z	850	-12/ -77	14	0	4.6	-77.7	77.8	8
89512	00	Z	250	-71/ 12	24	0	32.1	69.3	76.4	4
89664	00	Z	400	-78/ 167	25	1	30.3	73.0	79.0	8
97372	00	Z	150	-10/ 124	19	0	64.2	72.9	97.2	4

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – SEPTEMBER 1999 FIGURE 8
ALL HOURS
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1075

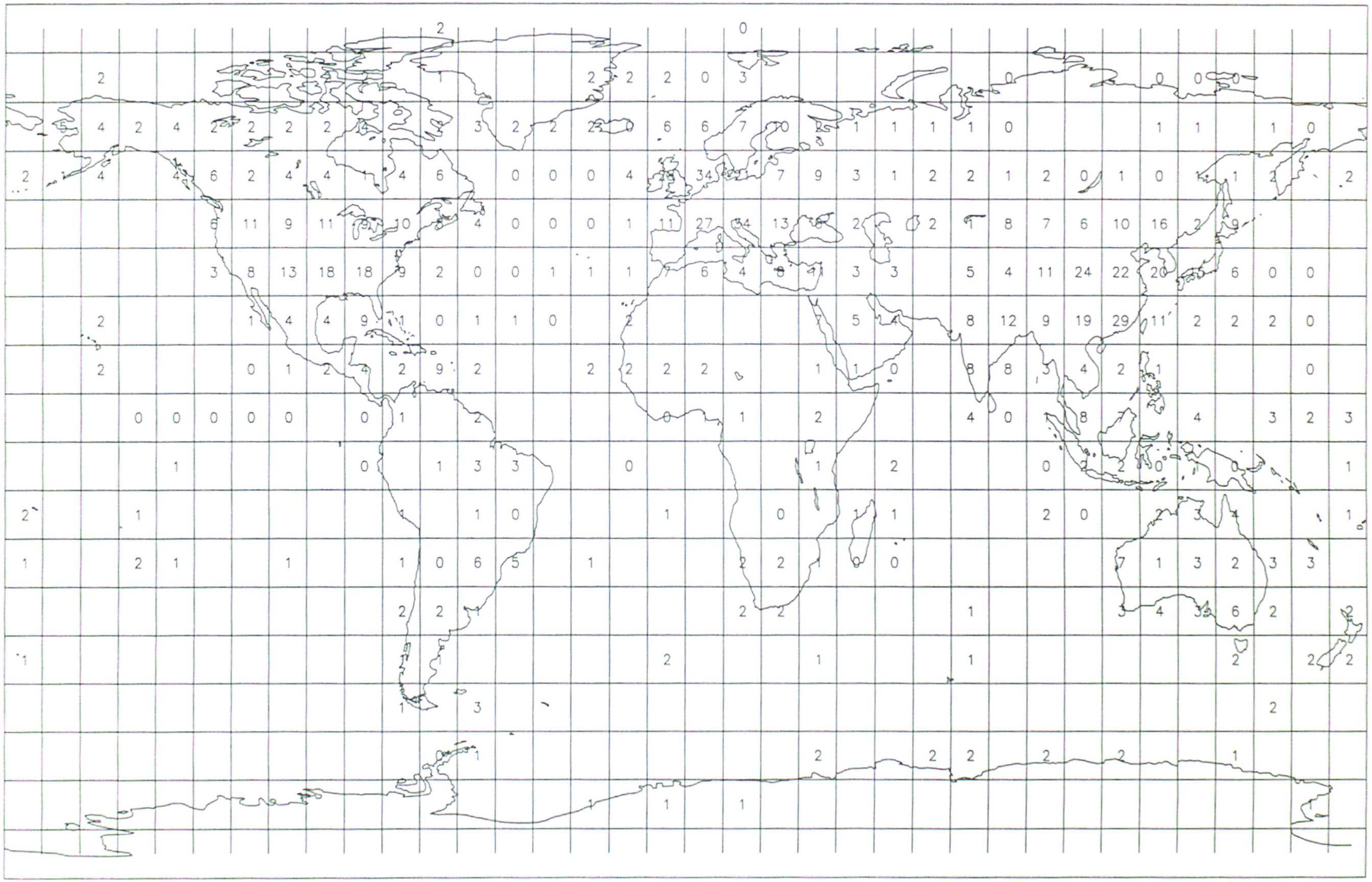

2 0
2 1 2 2 2 0 3 0 0 0 0
5 4 2 4 2 2 2 2 4 3 2 2 2 0 6 6 7 10 2 1 1 1 1 0 1 1 1 0
2 1 4 4 6 2 4 4 1 4 6 0 0 0 4 28 34 7 9 3 1 2 2 1 2 0 1 0 1 1 2 2
6 11 9 11 9 10 8 4 0 0 0 1 11 27 34 13 18 2 2 1 8 7 6 10 16 2 9
3 8 13 18 18 9 2 0 0 1 1 1 7 6 4 8 11 3 3 5 4 11 24 22 20 5 6 0 0
2 1 4 4 9 1 0 1 1 0 2 7 5 4 8 12 9 19 29 11 2 2 2 0
2 0 1 2 4 2 9 2 2 2 2 2 1 1 0 8 8 3 4 2 1 0
0 0 0 0 0 0 1 2 0 1 2 4 0 8 7 4 3 2 3
1 0 1 3 3 0 1 2 0 2 0 0 1
2 1 1 1 0 1 0 1 1 2 0 3 3 4 1 1
1 2 1 1 1 0 6 5 1 2 2 1 0 0 7 1 3 2 3 3
2 2 1 2 2 1 3 4 3 6 2 2
1 2 1 1 2 2 2
1 3 2
1 2 2 2 2 2 1
1 1 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : $\geq$ 10 observations and $\geq$ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
OXYH2	00	V	300	64/ -52	15	0	13	-2.2	-1.0	17.9	1
OXYH2	12	V	250	64/ -52	18	0	27	-4.4	1.5	20.1	2
40875	12	V	400	27/ 56	10	0	10	-9.1	3.2	15.5	1
48568	12	V	150	7/ 101	18	0	50	17.6	9.0	16.9	1
56146	00	V	100	32/ 100	14	4	33	18.4	-3.0	15.7	1
68512	12	V	200	-30/ 18	13	0	23	-11.1	-3.0	16.2	2
83612	12	V	100	-20/ -55	21	0	100	11.2	0.3	15.2	1

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – SEPTEMBER 1999 FIGURE 9

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1194

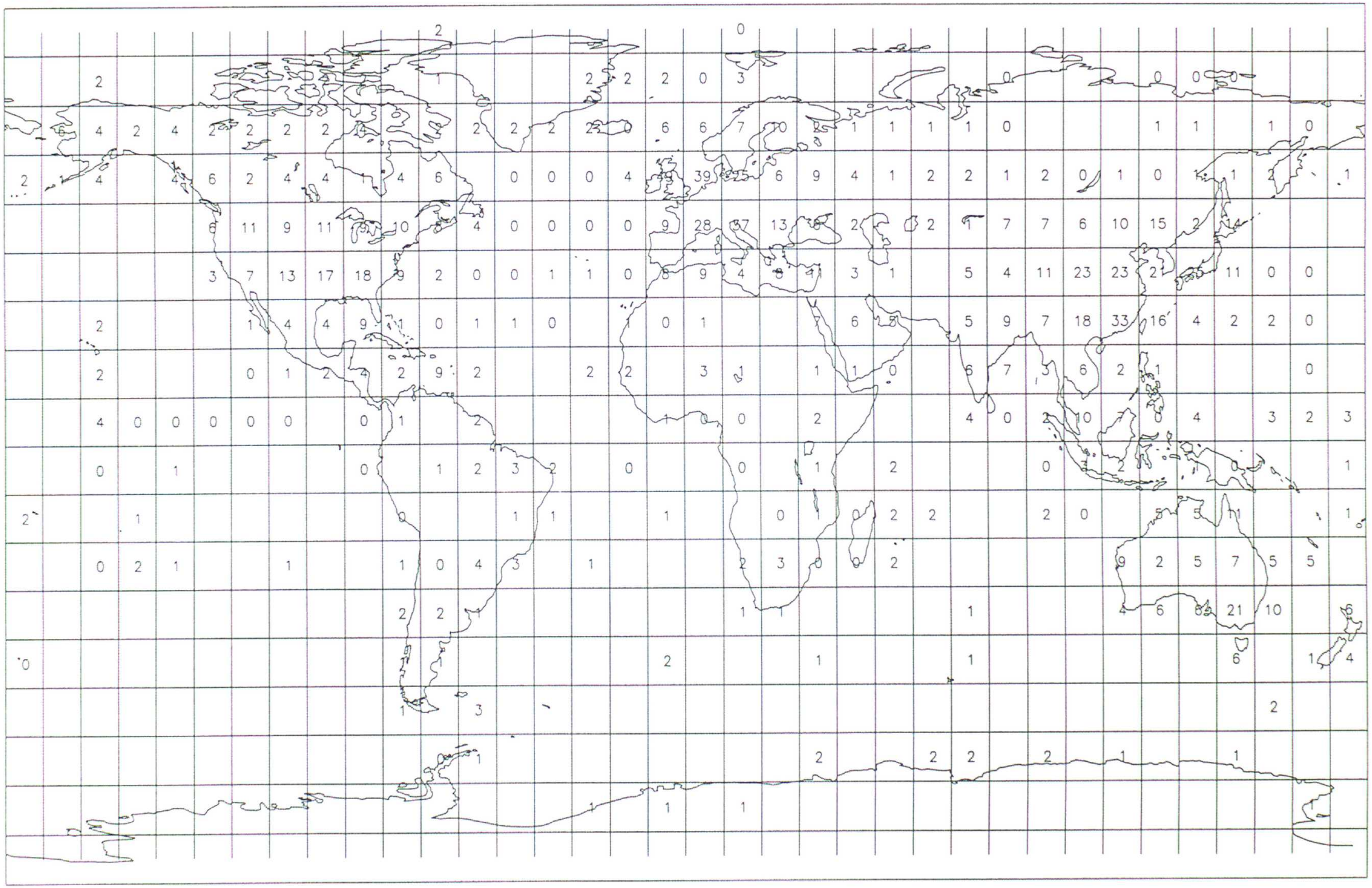

2 0
2 1 2 2 2 0 3 0 0 0 0
6 4 2 4 2 2 2 2 4 2 2 2 2 0 6 6 7 10 2 1 1 1 1 0 1 1 1 0
2 4 4 6 2 4 4 1 4 6 0 0 0 4 3 39 25 6 9 4 1 2 2 1 2 0 1 0 1 1 2 1
6 11 9 11 9 10 8 4 0 0 0 0 9 28 37 13 8 2 2 1 7 7 6 10 15 2 1
3 7 13 17 18 9 2 0 0 1 1 0 8 9 4 8 1 3 1 5 4 11 23 23 21 5 11 0 0
2 1 4 4 9 1 0 1 1 0 1 0 1 7 6 8 5 9 7 18 33 16 4 2 2 0
2 0 1 2 4 2 9 2 2 2 3 1 1 1 0 6 7 3 6 2 1 0
4 0 0 0 0 0 0 1 2 1 0 0 2 4 0 2 10 7 0 4 3 2 3
0 1 0 1 2 3 2 0 0 1 2 0 2 1 1
2 1 0 1 1 1 0 1 0 2 2 2 0 5 5 1 1
0 2 1 1 1 0 4 3 1 2 3 0 0 2 9 2 5 7 5 5
2 2 1 1 1 1 4 6 6 21 10 6
0 1 2 1 1 6 1 4
1 3 2
1 2 2 2 2 1 1
1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for radiosonde TEMPs.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from UKMO global model.
Observation times	:00 UTC and 12 UTC.
Level(s) monitored	:Standard levels between 500.0 - 150.0 hPa
Element monitored	:WIND DIRECTION in degrees

Parameters monitored

:NUM OBS	:Average number of observations at all levels.
:BIAS	:Mean difference of observations from background values from all levels.
:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
17280	00	DD	38/ 40	26	-10.4	2.9	10.8
17351	12	DD	37/ 35	26	-10.6	4.2	18.0
40179	12	DD	32/ 35	26	-10.3	3.1	9.6
48914	00	DD	9/ 105	8	36.8	8.0	21.8
59758	12	DD	20/ 110	14	13.8	6.3	24.1
62337	00	DD	31/ 34	26	-15.9	5.8	12.3
62337	12	DD	31/ 34	24	-17.9	4.5	10.1
64458	12	DD	2/ 16	7	-14.8	6.3	21.5
78866	00	DD	18/ -63	10	-23.2	9.2	23.5
78866	12	DD	18/ -63	9	-14.6	7.6	22.1
81405	12	DD	5/ -52	21	10.1	6.0	23.3

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: mmm,yy

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

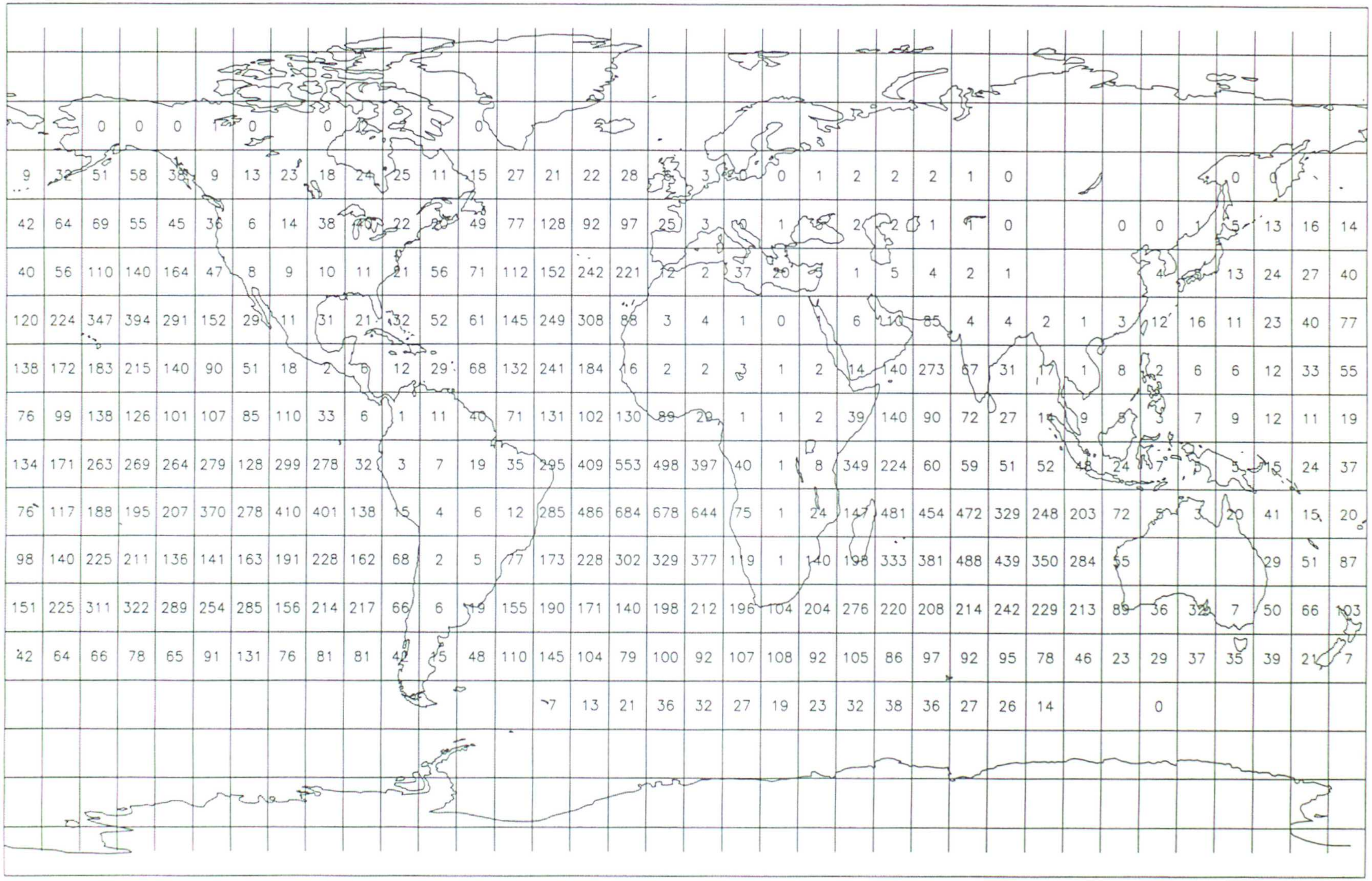
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
SEPTEMBER 1999

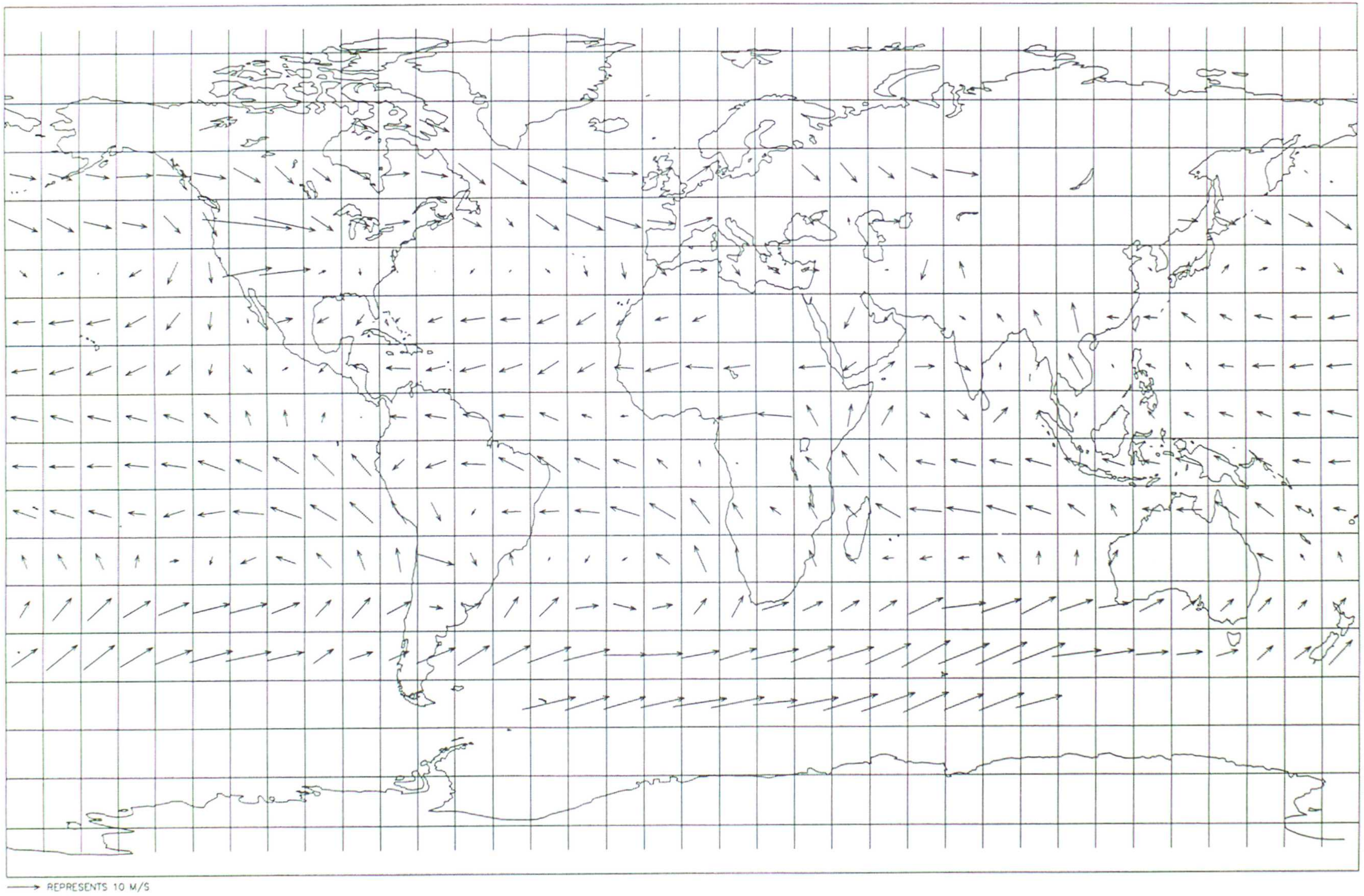


		0	0	0	1	0		0				0																							
9	32	51	58	38	9	13	23	18	24	25	11	15	27	21	22	28	[illegible]	3	0	0	1	2	2	2	1	0						0	0		
42	64	69	55	45	36	6	14	38	40	22	20	49	77	128	92	97	25	3	0	1	5	2	2	1	1	0			0	0	1	5	13	16	14
40	56	110	140	164	47	8	9	10	11	21	56	71	112	152	242	221	12	2	37	20	5	1	5	4	2	1				4	[illegible]	13	24	27	40
120	224	347	394	291	152	29	11	31	21	32	52	61	145	249	308	88	3	4	1	0	1	6	10	85	4	4	2	1	3	12	16	11	23	40	77
138	172	183	215	140	90	51	18	2	6	12	29	68	132	241	184	16	2	2	3	1	2	14	140	273	67	31	17	1	8	2	6	6	12	33	55
76	99	138	126	101	107	85	110	33	6	1	11	40	71	131	102	130	89	29	1	1	2	39	140	90	72	27	14	9	8	3	7	9	12	11	19
134	171	263	269	264	279	128	299	278	32	3	7	19	35	295	409	553	498	397	40	1	8	349	224	60	59	51	52	48	24	7	5	5	15	24	37
76	117	188	195	207	370	278	410	401	138	15	4	6	12	285	486	684	678	644	75	1	24	147	481	454	472	329	248	203	72	5	3	20	41	15	20
98	140	225	211	136	141	163	191	228	162	68	2	5	77	173	228	302	329	377	119	1	140	198	333	381	488	439	350	284	55				29	51	87
151	225	311	322	289	254	285	156	214	217	66	6	19	155	190	171	140	198	212	196	104	204	276	220	208	214	242	229	213	89	36	32	7	50	66	103
42	64	66	78	65	91	131	76	81	81	42	15	48	110	145	104	79	100	92	107	108	92	105	86	97	92	95	78	46	23	29	37	35	39	21	7
														7	13	21	36	32	27	19	23	32	38	36	27	26	14			0					

SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 701–1000 HPA

FIGURE 11

SEPTEMBER 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


→ REPRESENTS 10 M/S

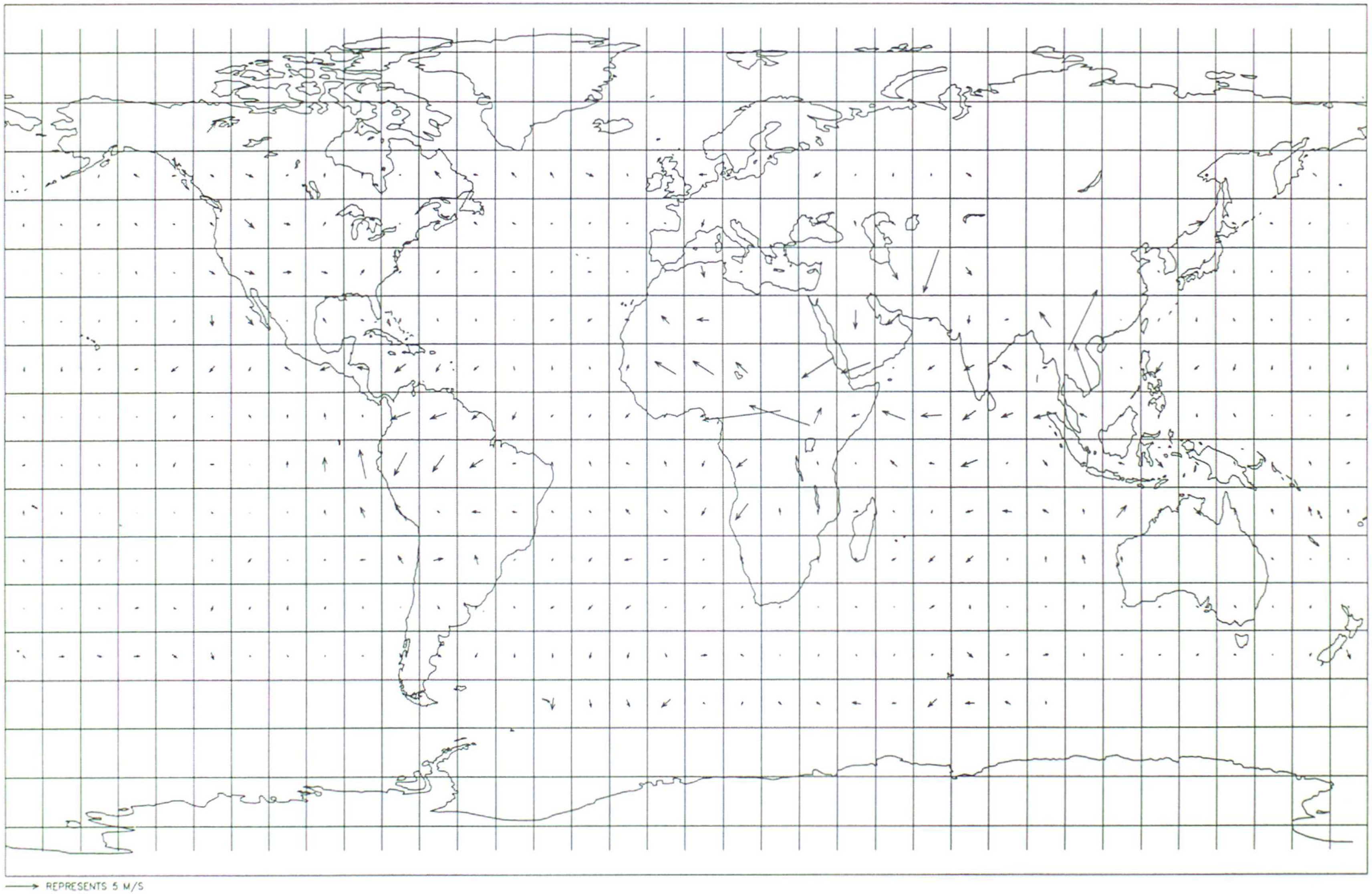
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701-1000 HPA

FIGURE 12

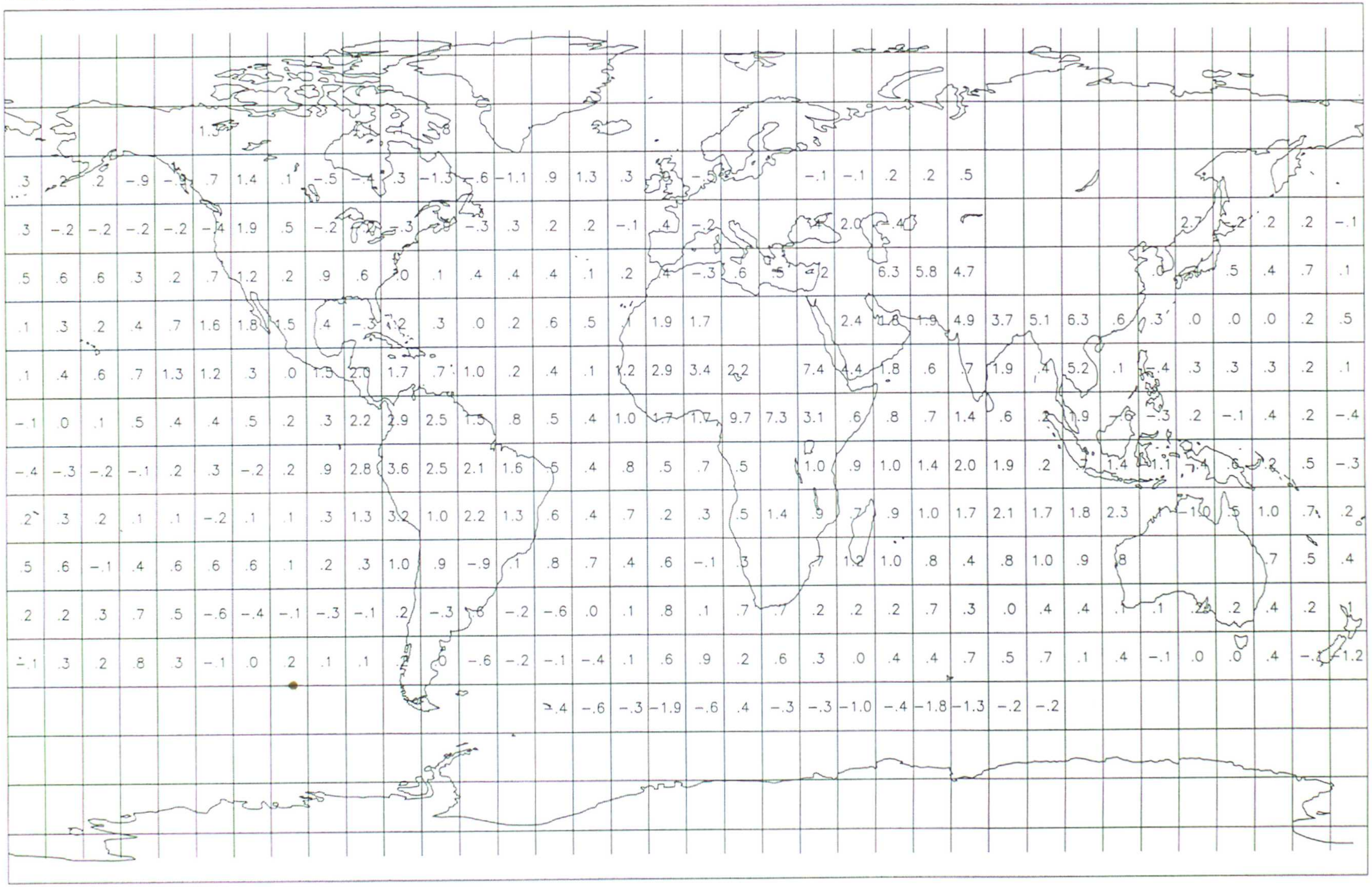
SEPTEMBER 1999

ALL OBSERVATIONS

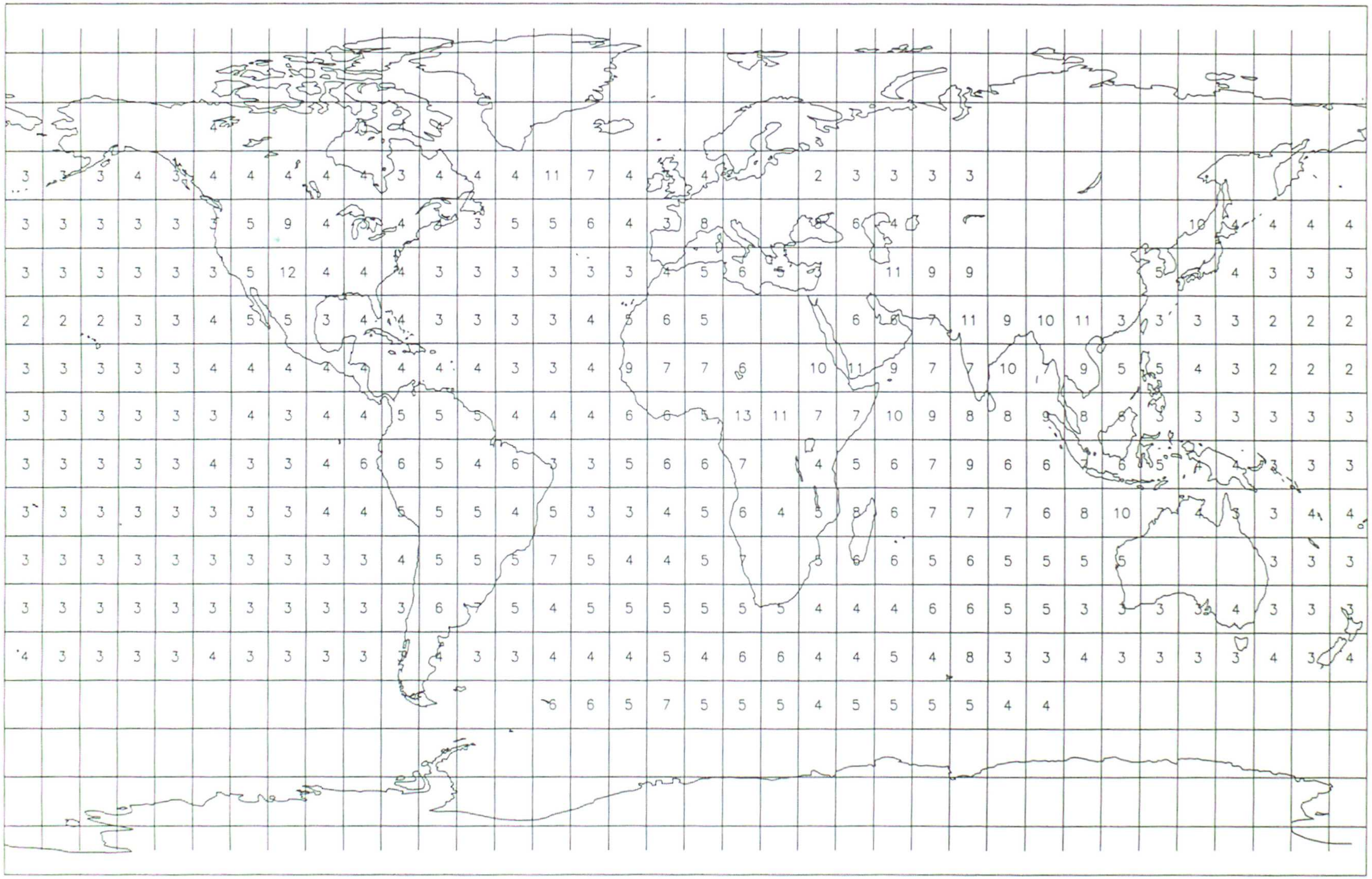
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT



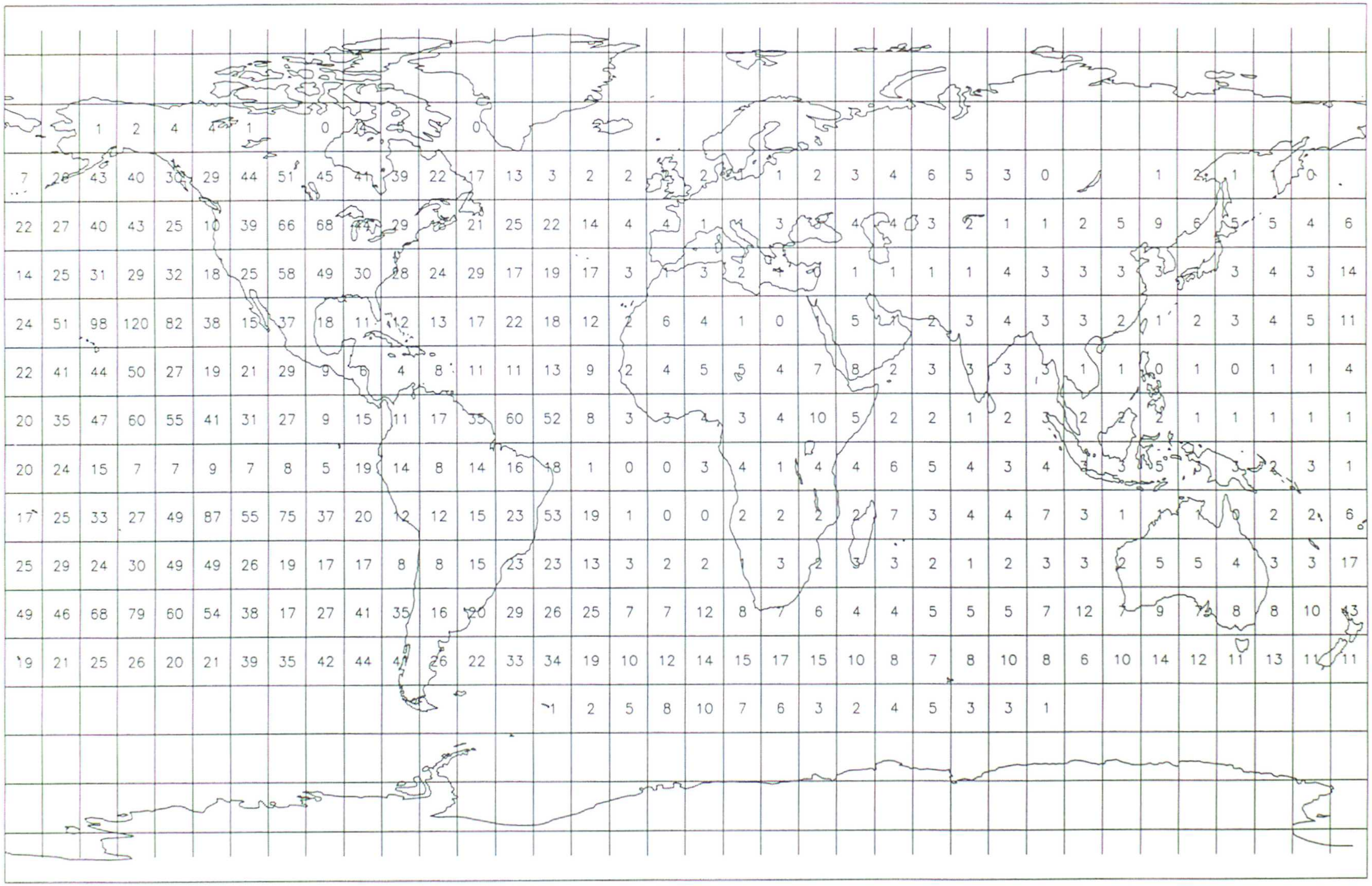
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
SEPTEMBER 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


1.3
.3 .2 .2 –.9 –.9 .7 1.4 .1 –.5 –.4 .3 –1.3 –.6 –1.1 .9 1.3 .3 –.5 –.1 –.1 .2 .2 .5
.3 –.2 –.2 –.2 –.2 –.4 1.9 .5 –.2 –.3 –.3 .3 .2 .2 –.1 .4 –.2 .4 2.0 –.4 2.7 –.2 .2 .2 –.1
.5 .6 .6 .3 .2 .7 1.2 .2 .9 .6 .0 .1 .4 .4 .4 .1 .2 .4 –.3 .6 .5 .2 6.3 5.8 4.7 .0 .5 .4 .7 .1
.1 .3 .2 .4 .7 1.6 1.8 1.5 .4 –.3 .2 .3 .0 .2 .6 .5 .1 1.9 1.7 2.4 1.8 1.9 4.9 3.7 5.1 6.3 .6 .3 .0 .0 .0 .2 .5
.1 .4 .6 .7 1.3 1.2 .3 .0 1.5 2.0 1.7 .7 1.0 .2 .4 .1 1.2 2.9 3.4 2.2 7.4 4.4 1.8 .6 .7 1.9 .4 5.2 .1 .4 .3 .3 .3 .2 .1
–.1 0 .1 .5 .4 .4 .5 .2 .3 2.2 2.9 2.5 1.5 .8 .5 .4 1.0 1.7 1.7 9.7 7.3 3.1 .6 .8 .7 1.4 .6 .2 1.9 –.6 –.3 .2 –.1 .4 .2 –.4
–.4 –.3 –.2 –.1 .2 .3 –.2 .2 .9 2.8 3.6 2.5 2.1 1.6 .5 .4 .8 .5 .7 .5 1.0 .9 1.0 1.4 2.0 1.9 .2 .7 1.4 1.1 .4 .6 .2 .5 –.3
.2 .3 .2 .1 .1 –.2 .1 .1 .3 1.3 3.2 1.0 2.2 1.3 .6 .4 .7 .2 .3 .5 1.4 .9 .7 .9 1.0 1.7 2.1 1.7 1.8 2.3 .1 1.0 .5 1.0 .7 .2
.5 .6 –.1 .4 .6 .6 .6 .1 .2 .3 1.0 .9 –.9 .1 .8 .7 .4 .6 –.1 .3 .7 1.2 1.0 .8 .4 .8 1.0 .9 .8 .7 .5 .4
.2 .2 .3 .7 .5 –.6 –.4 –.1 –.3 –.1 .2 –.3 .6 –.2 –.6 .0 .1 .8 .1 .7 .7 .2 .2 .2 .7 .3 .0 .4 .4 .1 .1 .2 .2 .4 .2 .1
–.1 .3 .2 .8 .3 –.1 .0 .2 .1 .1 .2 .0 –.6 –.2 –.1 –.4 .1 .6 .9 .2 .6 .3 .0 .4 .4 .7 .5 .7 .1 .4 –.1 .0 .0 .4 –.1 –1.2
.4 –.6 –.3 –1.9 –.6 .4 –.3 –.3 –1.0 –.4 –1.8 –1.3 –.2 –.2

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
SEPTEMBER 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


3 3 3 4 3 4 4 4 4 4 3 4 4 4 11 7 4 4 2 3 3 3 3
3 3 3 3 3 3 5 9 4 4 4 3 5 5 6 4 3 8 6 6 4 10 4 4 4 4
3 3 3 3 3 3 5 12 4 4 4 3 3 3 3 3 3 4 5 6 5 11 9 9 5 4 3 3 3
2 2 2 3 3 4 5 5 3 4 4 3 3 3 3 4 5 6 5 6 6 7 11 9 10 11 3 3 3 3 2 2 2
3 3 3 3 3 4 4 4 4 4 4 4 4 3 3 4 9 7 7 6 10 11 9 7 7 10 7 9 5 5 4 3 2 2 2
3 3 3 3 3 3 4 3 4 4 5 5 5 4 4 4 6 6 5 13 11 7 7 10 9 8 8 9 8 6 3 3 3 3 3 3
3 3 3 3 3 4 3 3 4 6 6 5 4 6 3 3 5 6 6 7 4 5 6 7 9 6 6 6 5 4 3 3 3
3 3 3 3 3 3 3 3 4 4 5 5 5 4 5 3 3 4 5 6 4 5 8 6 7 7 7 6 8 10 7 4 3 3 4 4
3 3 3 3 3 3 3 3 3 3 4 5 5 5 7 5 4 4 5 7 5 6 6 5 6 5 5 5 5 3 3 3
3 3 3 3 3 3 3 3 3 3 3 6 7 5 4 5 5 5 5 5 5 4 4 4 6 6 5 5 3 3 3 3 4 3 3 3
4 3 3 3 3 4 3 3 3 3 4 3 3 4 4 4 5 4 6 6 4 4 5 4 8 3 3 4 3 3 3 3 4 3 4
6 6 5 7 5 5 5 4 5 5 5 5 4 4

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
SEPTEMBER 1999



		1	2	4	4	1		0	4	5	4	0																							
7	28	43	40	30	29	44	51	45	41	39	22	17	13	3	2	2	2	2		1	2	3	4	6	5	3	0			1	2	1	1	0	
22	27	40	43	25	10	39	66	68	44	29	18	21	25	22	14	4	4	1	1	3	3	4	4	3	2	1	1	2	5	9	6	5	5	4	6
14	25	31	29	32	18	25	58	49	30	28	24	29	17	19	17	3	1	3	2	1	0	1	1	1	1	4	3	3	3	3		3	4	3	14
24	51	98	120	82	38	15	37	18	11	12	13	17	22	18	12	2	6	4	1	0	1	5	1	2	3	4	3	3	2	1	2	3	4	5	11
22	41	44	50	27	19	21	29	9	6	4	8	11	11	13	9	2	4	5	5	4	7	8	2	3	3	3	3	1	1	0	1	0	1	1	4
20	35	47	60	55	41	31	27	9	15	11	17	35	60	52	8	3	3	4	3	4	10	5	2	2	1	2	3	2	2	2	1	1	1	1	1
20	24	15	7	7	9	7	8	5	19	14	8	14	16	18	1	0	0	3	4	1	4	4	6	5	4	3	4	3	3	5	3	3	2	3	1
17	25	33	27	49	87	55	75	37	20	12	12	15	23	53	19	1	0	0	2	2	2	2	7	3	4	4	7	3	1	1	1	0	2	2	6
25	29	24	30	49	49	26	19	17	17	8	8	15	23	23	13	3	2	2	1	3	2	3	3	2	1	2	3	3	2	5	5	4	3	3	17
49	46	68	79	60	54	38	17	27	41	35	16	20	29	26	25	7	7	12	8	7	6	4	4	5	5	5	7	12	7	9	7	8	8	10	13
19	21	25	26	20	21	39	35	42	44	41	26	22	33	34	19	10	12	14	15	17	15	10	8	7	8	10	8	6	10	14	12	11	13	11	11
														1	2	5	8	10	7	6	3	2	4	5	3	3	1								

SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA

SEPTEMBER 1999

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16

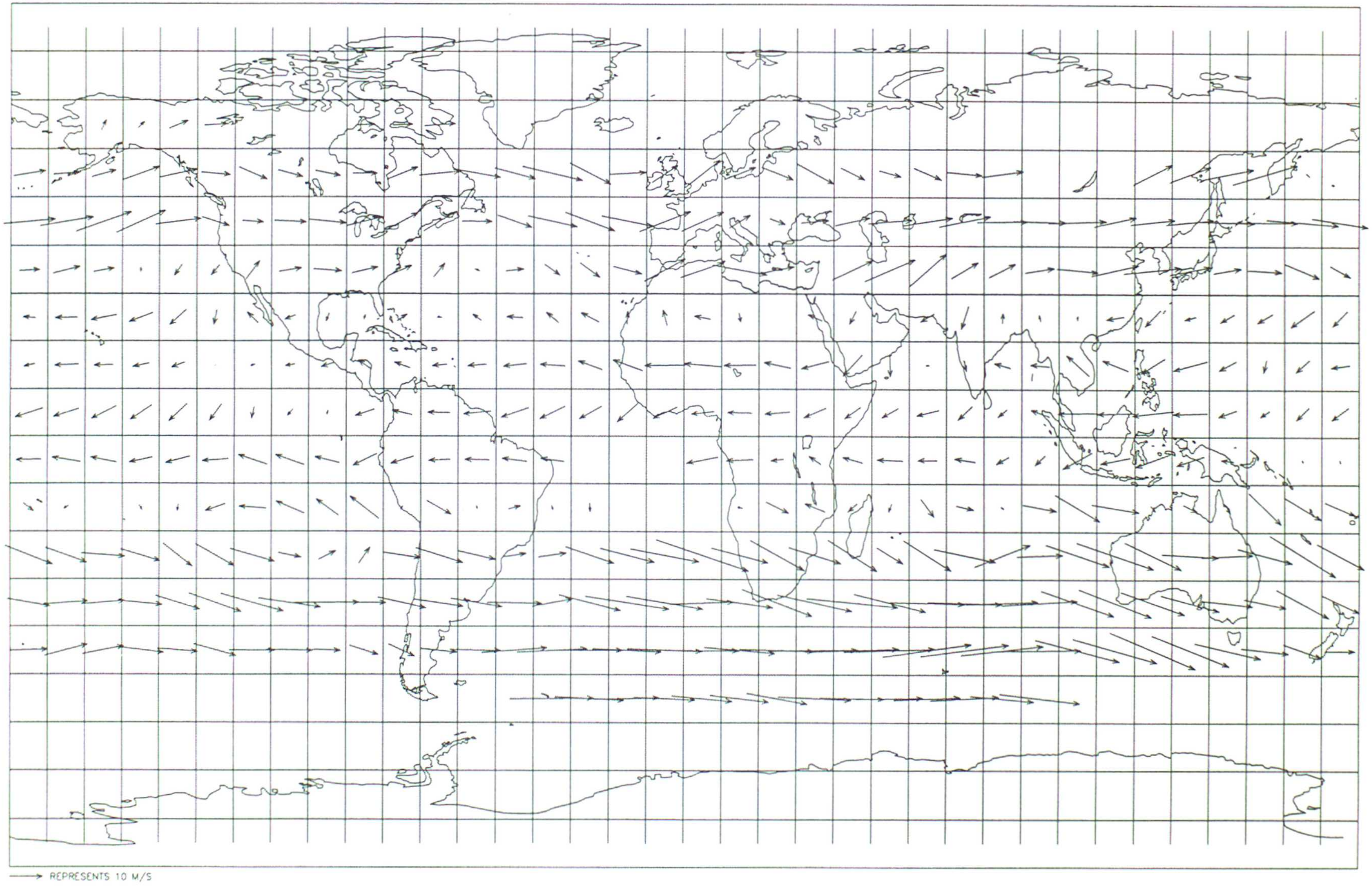
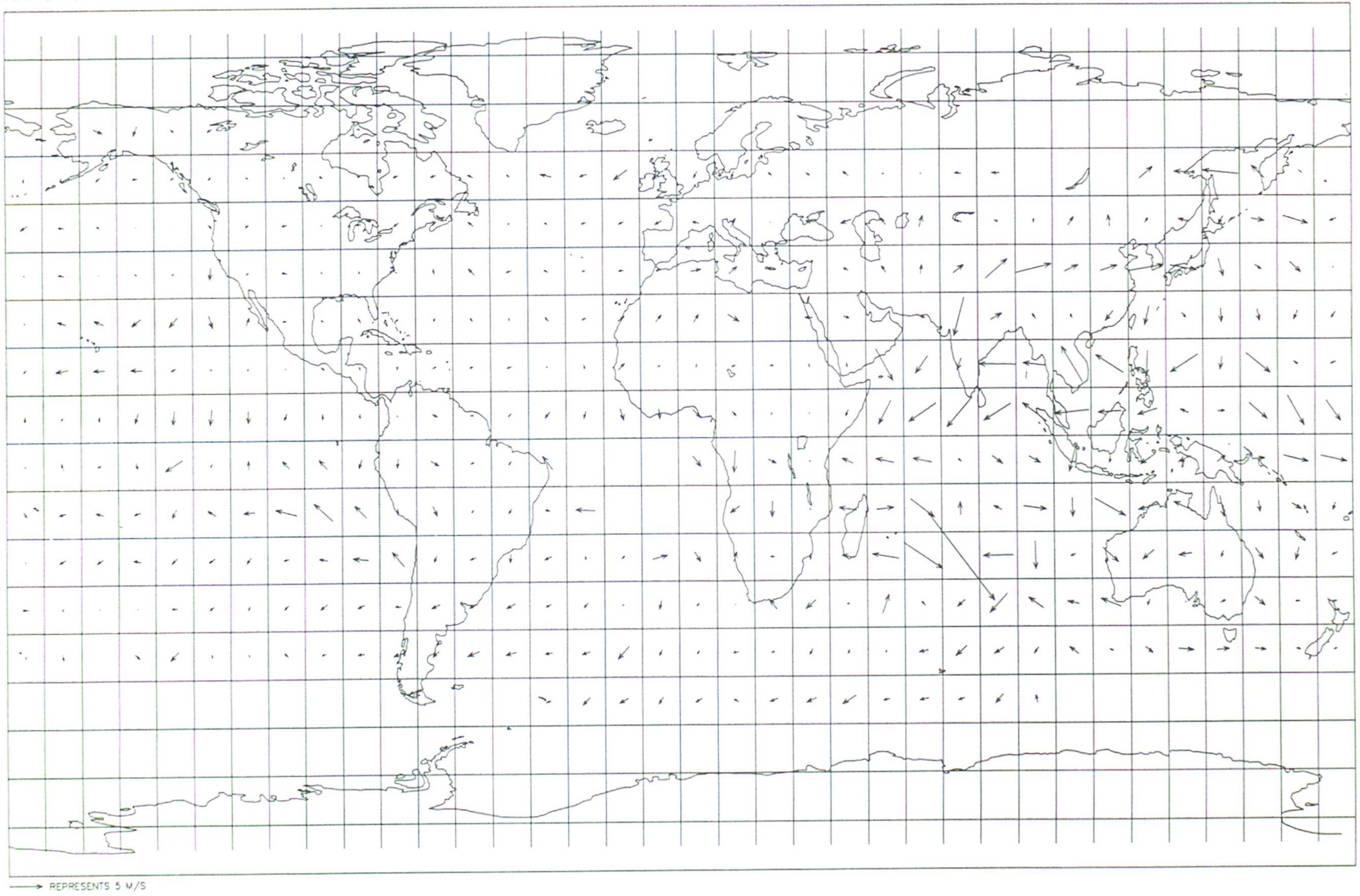
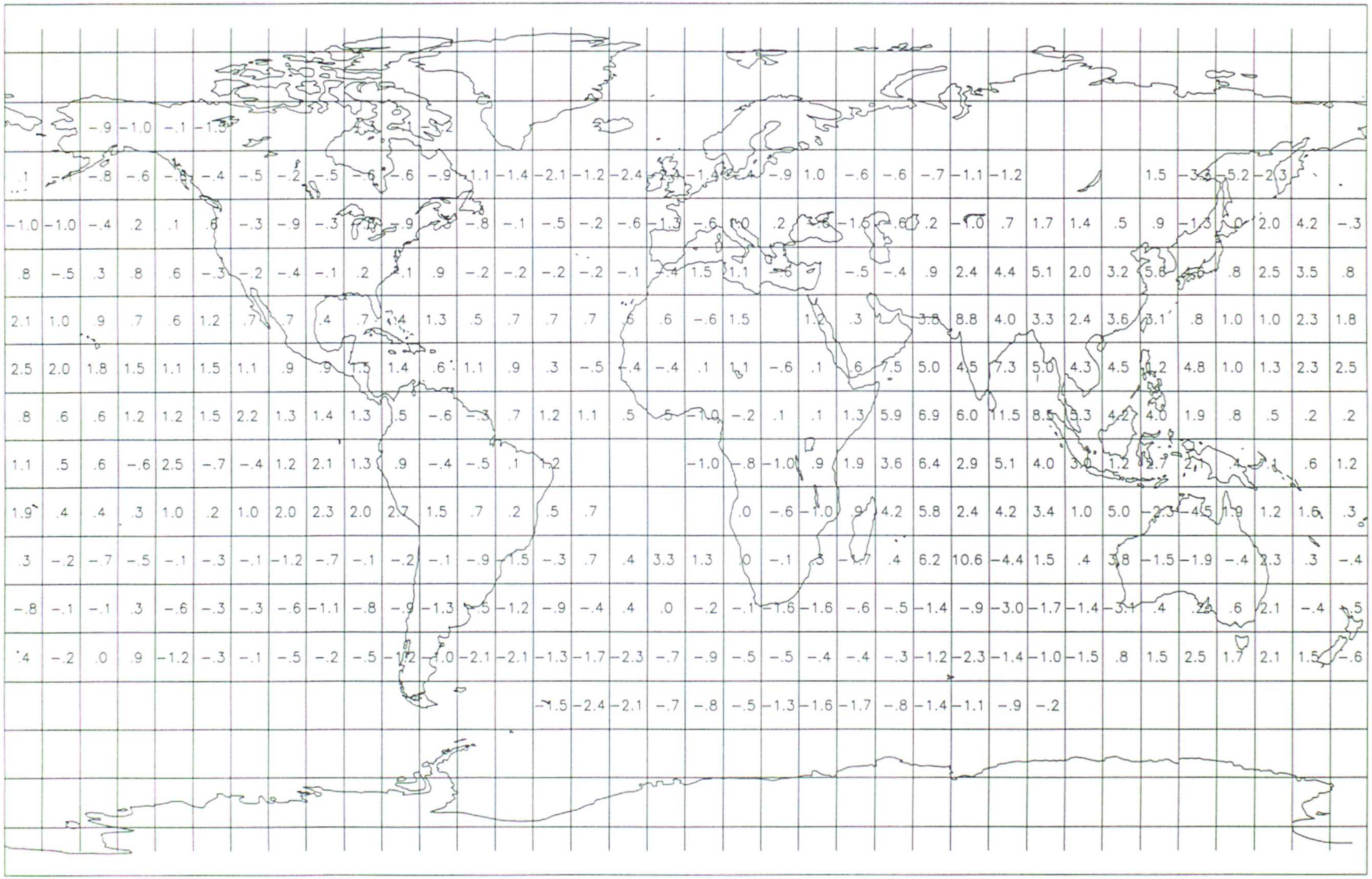

REPRESENTS 10 M/S

FIGURE 17

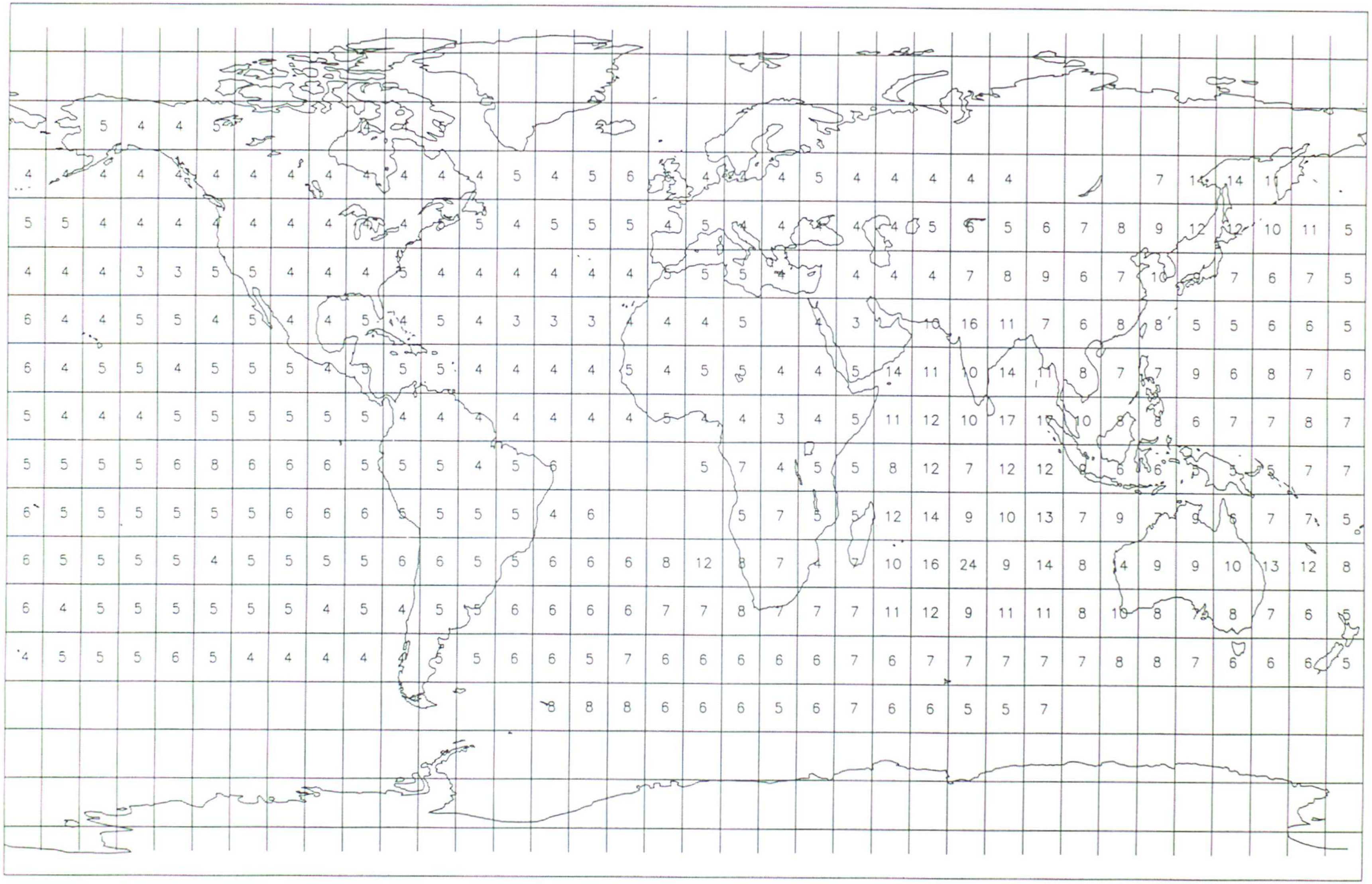
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA
SEPTEMBER 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT



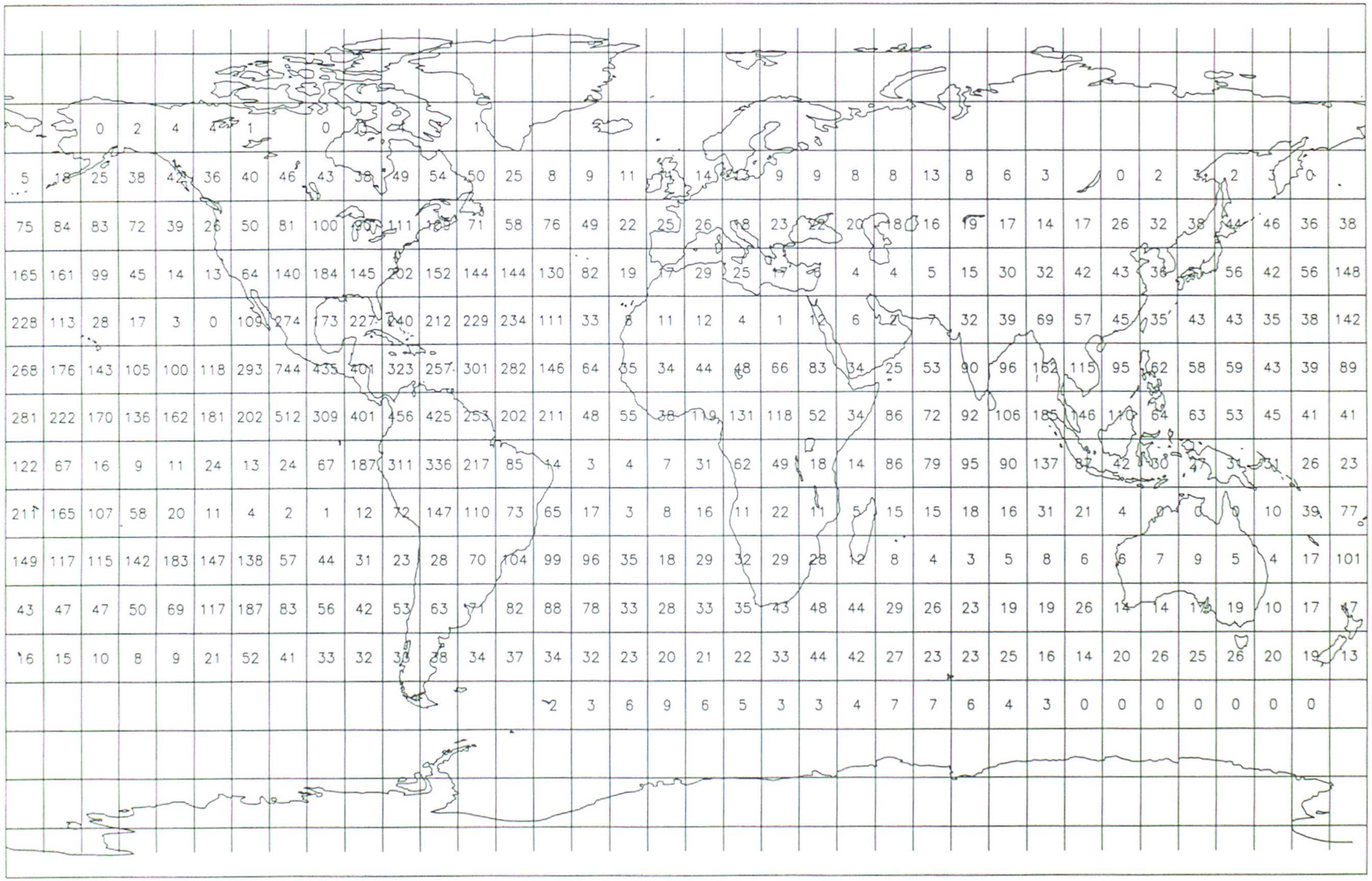
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
SEPTEMBER 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-.9 -1.0 -.1 -1.3 .1 -1.2
.1 -.1 -.8 -.6 -.8 -.4 -.5 -.2 -.5 -.6 -.6 -.9 -1.1 -1.4 -2.1 -1.2 -2.4 -2.1 -1.4 -.4 -.9 1.0 -.6 -.6 -.7 -1.1 -1.2 1.5 -3.3 -5.2 -2.3
-1.0 -1.0 -.4 .2 .1 .6 -.3 -.9 -.3 -.9 -.8 -.1 -.5 -.2 -.6 -1.3 -.6 1.0 .2 -.6 -1.5 -.6 .2 -1.0 .7 1.7 1.4 .5 .9 -1.3 .0 2.0 4.2 -.3
.8 -.5 .3 .8 .6 -.3 -.2 -.4 -.1 .2 -.1 .9 -.2 -.2 -.2 -.2 -.1 -.4 1.5 1.1 -.6 -.5 -.4 .9 2.4 4.4 5.1 2.0 3.2 5.6 4.6 .8 2.5 3.5 .8
2.1 1.0 .9 .7 .6 1.2 .7 .7 .4 .7 .4 1.3 .5 .7 .7 .7 .6 .6 -.6 1.5 1.2 .3 3.8 8.8 4.0 3.3 2.4 3.6 3.1 .8 1.0 1.0 2.3 1.8
2.5 2.0 1.8 1.5 1.1 1.5 1.1 .9 .9 1.5 1.4 .6 1.1 .9 .3 -.5 -.4 -.4 .1 1.1 -.6 .1 .6 7.5 5.0 4.5 7.3 5.0 4.3 4.5 1.2 4.8 1.0 1.3 2.3 2.5
.8 .6 .6 1.2 1.2 1.5 2.2 1.3 1.4 1.3 .5 -.6 -.3 .7 1.2 1.1 .5 .5 -1.0 -.2 .1 .1 1.3 5.9 6.9 6.0 11.5 8.5 5.3 4.2 4.0 1.9 .8 .5 .2 .2
1.1 .5 .6 -.6 2.5 -.7 -.4 1.2 2.1 1.3 .9 -.4 -.5 .1 1.2 -1.0 -.8 -1.0 .9 1.9 3.6 6.4 2.9 5.1 4.0 3.0 1.2 2.7 2.1 .4 .1 .6 1.2
1.9 .4 .4 .3 1.0 .2 1.0 2.0 2.3 2.0 2.7 1.5 .7 .2 .5 .7 .0 -.6 -1.0 .9 4.2 5.8 2.4 4.2 3.4 1.0 5.0 -2.3 -4.5 1.9 1.2 1.6 .3
.3 -.2 -.7 -.5 -.1 -.3 -.1 -1.2 -.7 -.1 -.2 -.1 -.9 -1.5 -.3 .7 .4 3.3 1.3 .0 -.1 .3 -1.7 .4 6.2 10.6 -4.4 1.5 .4 3.8 -1.5 -1.9 -.4 2.3 .3 -.4
-.8 -.1 -.1 .3 -.6 -.3 -.3 -.6 -1.1 -.8 -.9 -1.3 -.5 -1.2 -.9 -.4 .4 .0 -.2 -.1 -1.6 -1.6 -.6 -.5 -1.4 -.9 -3.0 -1.7 -1.4 -3.1 .4 .2 .6 2.1 -.4 -.5
.4 -.2 .0 .9 -1.2 -.3 -.1 -.5 -.2 -.5 -1.2 -1.0 -2.1 -2.1 -1.3 -1.7 -2.3 -.7 -.9 -.5 -.5 -.4 -.4 -.3 -1.2 -2.3 -1.4 -1.0 -1.5 .8 1.5 2.5 1.7 2.1 1.5 -.6
-1.5 -2.4 -2.1 -.7 -.8 -.5 -1.3 -1.6 -1.7 -.8 -1.4 -1.1 -.9 -.2

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
SEPTEMBER 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

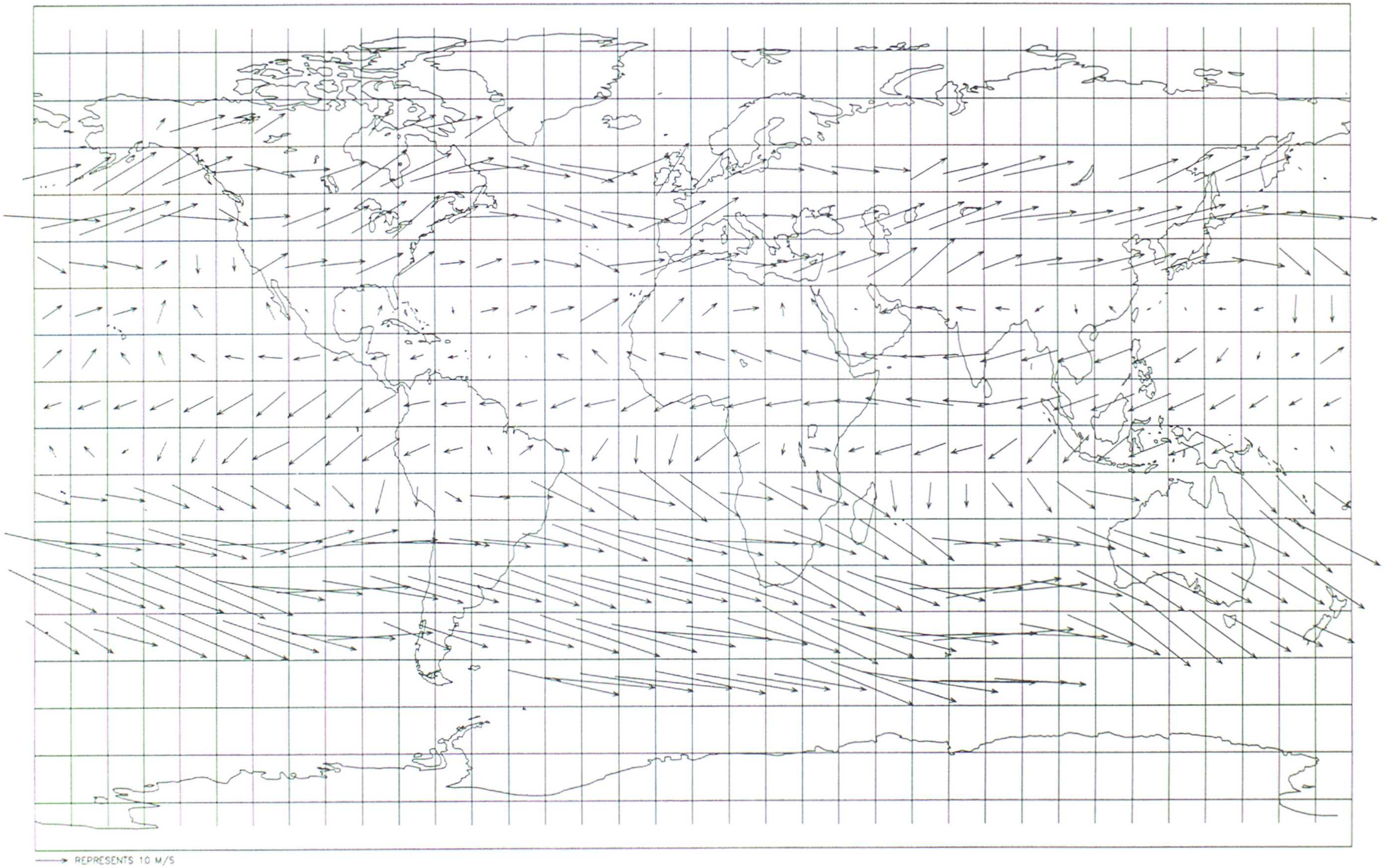

5 4 4 5 4
4 4 4 4 4 4 4 4 4 4 4 4 4 5 4 5 6 4 4 4 4 5 4 4 4 4 4 7 14 14 11
5 5 4 4 4 4 4 4 4 4 4 5 5 4 5 5 5 4 5 4 4 4 4 4 5 6 5 6 7 8 9 12 12 10 11 5
4 4 4 3 3 5 5 4 4 4 5 4 4 4 4 4 4 5 5 5 4 4 4 4 7 8 9 6 7 10 7 6 7 5
6 4 4 5 5 4 5 4 4 5 4 5 4 3 3 3 4 4 4 5 4 3 10 16 11 7 6 8 8 5 5 6 6 5
6 4 5 5 4 5 5 5 4 5 5 5 4 4 4 4 5 4 5 5 4 4 5 14 11 10 14 11 8 7 7 9 6 8 7 6
5 4 4 4 5 5 5 5 5 5 4 4 4 4 4 4 4 5 4 4 3 4 5 11 12 10 17 17 10 8 8 6 7 7 8 7
5 5 5 5 6 8 6 6 6 5 5 5 4 5 6 5 7 4 5 5 8 12 7 12 12 9 6 6 5 5 5 7 7
6 5 5 5 5 5 5 6 6 6 5 5 5 5 4 6 5 7 5 5 12 14 9 10 13 7 9 7 9 6 7 7 5
6 5 5 5 5 4 5 5 5 5 6 6 5 5 6 6 6 8 12 8 7 4 7 10 16 24 9 14 8 4 9 9 10 13 12 8
6 4 5 5 5 5 5 5 4 5 4 5 5 6 6 6 6 7 7 8 7 7 7 11 12 9 11 11 8 10 8 7 8 7 6 5
4 5 5 5 6 5 4 4 4 4 4 5 5 6 6 5 7 6 6 6 6 6 7 6 7 7 7 7 7 8 8 7 6 6 6 5
8 8 8 6 6 6 5 6 7 6 6 5 5 7

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
SEPTEMBER 1999



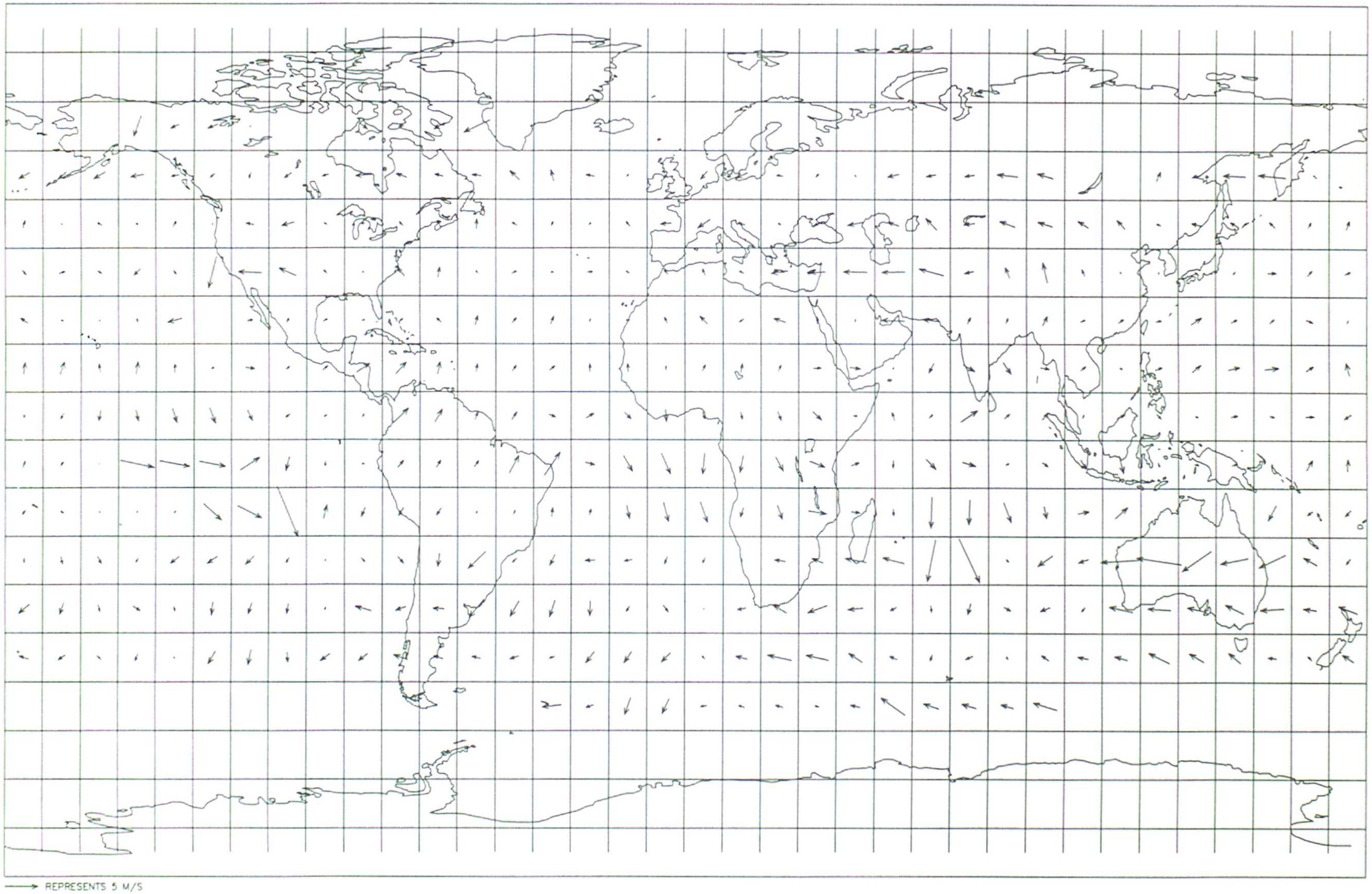
		0	2	4	4	1		0	[illegible]	[illegible]		1																							
5	18	25	38	42	36	40	46	43	38	49	54	50	25	8	9	11	11	14	13	9	9	8	8	13	8	6	3		0	2	3	2	3	0	
75	84	83	72	39	26	50	81	100	90	111	[illegible]	71	58	76	49	22	25	26	18	23	22	20	18	16	19	17	14	17	26	32	38	44	46	36	38
165	161	99	45	14	13	64	140	184	145	202	152	144	144	130	82	19	17	29	25	17	[illegible]	4	4	5	15	30	32	42	43	36		56	42	56	148
228	113	28	17	3	0	109	274	173	227	240	212	229	234	111	33	8	11	12	4	1	12	6	2	7	32	39	69	57	45	35	43	43	35	38	142
268	176	143	105	100	118	293	744	435	401	323	257	301	282	146	64	35	34	44	48	66	83	34	25	53	90	96	162	115	95	62	58	59	43	39	89
281	222	170	136	162	181	202	512	309	401	456	425	253	202	211	48	55	38	119	131	118	52	34	86	72	92	106	185	146	110	64	63	53	45	41	41
122	67	16	9	11	24	13	24	67	187	311	336	217	85	14	3	4	7	31	62	49	18	14	86	79	95	90	137	87	42	30	47	31	31	26	23
211	165	107	58	20	11	4	2	1	12	72	147	110	73	65	17	3	8	16	11	22	11	5	15	15	18	16	31	21	4	0	0	0	10	39	77
149	117	115	142	183	147	138	57	44	31	23	28	70	104	99	96	35	18	29	32	29	28	12	8	4	3	5	8	6	6	7	9	5	4	17	101
43	47	47	50	69	117	187	83	56	42	53	63	71	82	88	78	33	28	33	35	43	48	44	29	26	23	19	19	26	14	14	[illegible]	19	10	17	47
16	15	10	8	9	21	52	41	33	32	33	38	34	37	34	32	23	20	21	22	33	44	42	27	23	23	25	16	14	20	26	25	26	20	19	13
														2	3	6	9	6	5	3	3	4	7	7	6	4	3	0	0	0	0	0	0	0	

SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 101–400 HPA FIGURE 21
SEPTEMBER 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

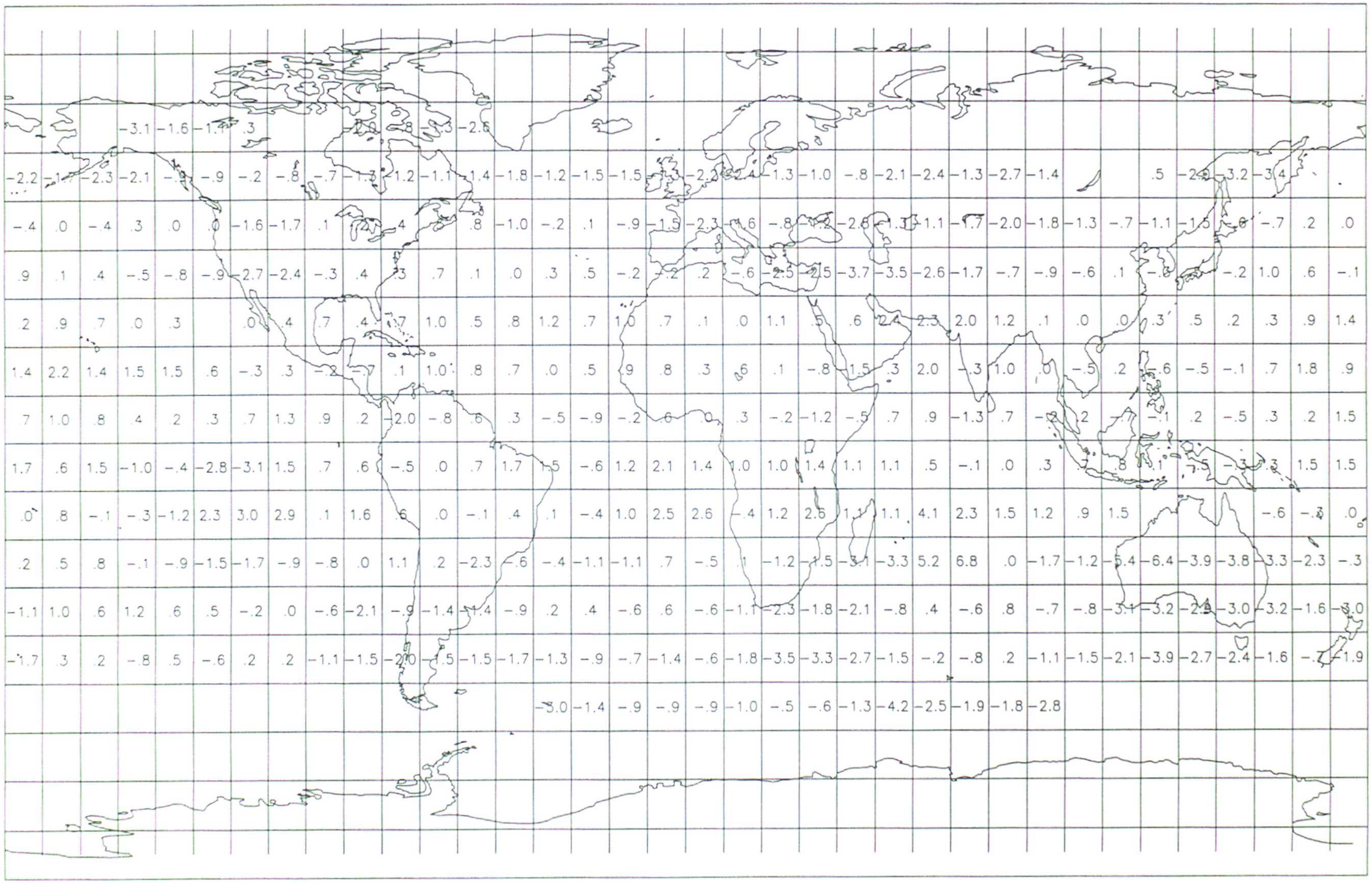

→ REPRESENTS 10 M/S

SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 101–400 HPA
SEPTEMBER 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

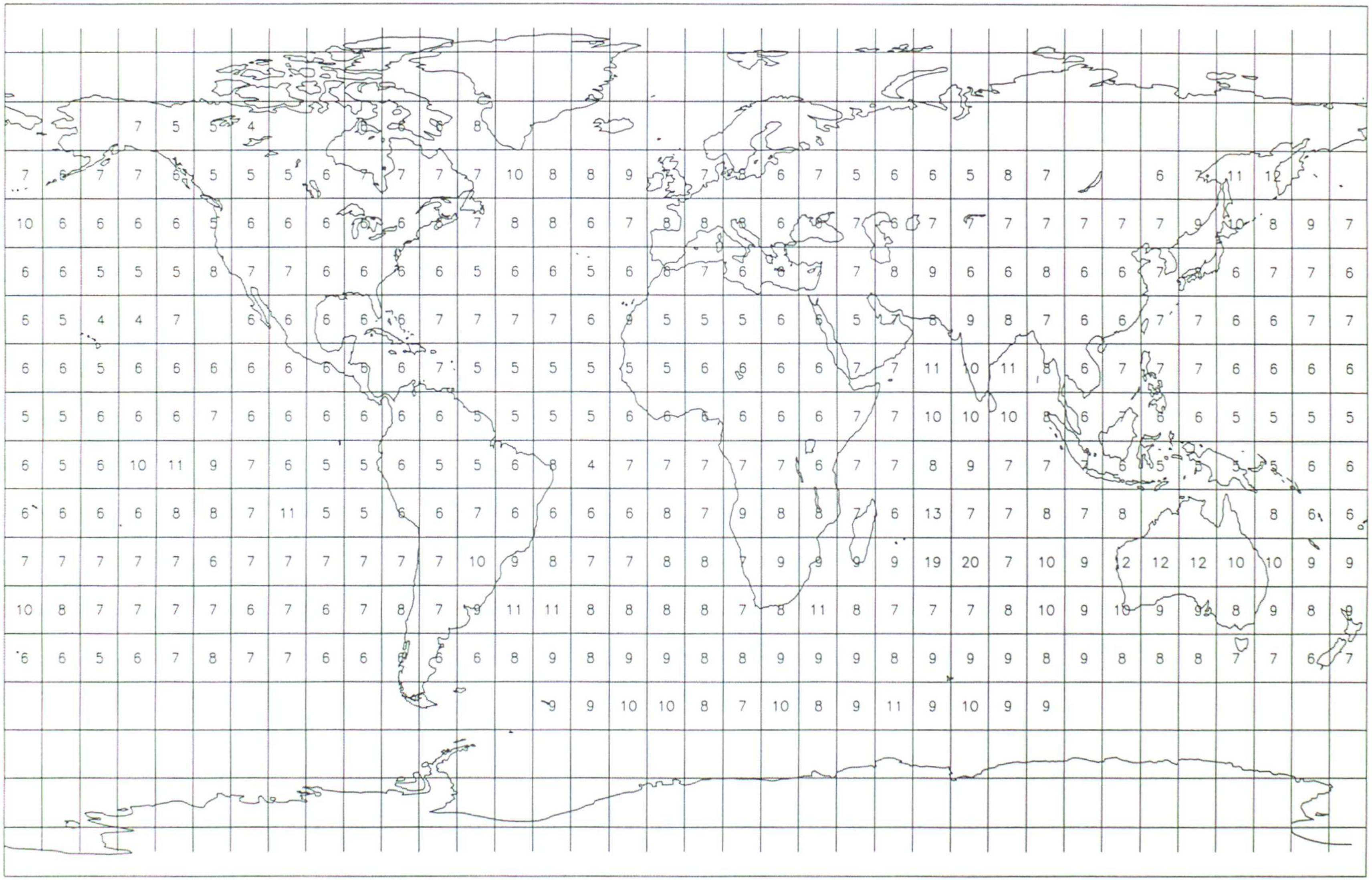
FIGURE 22



SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
SEPTEMBER 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-3.1 -1.6 -1.7 .3 -2.0 -.8 -1.3 -2.6
-2.2 -1.7 -2.3 -2.1 -.9 -.9 -.2 -.8 -.7 -1.3 -1.2 -1.1 -1.4 -1.8 -1.2 -1.5 -1.5 -1.3 -2.2 -2.4 -1.3 -1.0 -.8 -2.1 -2.4 -1.3 -2.7 -1.4 .5 -2.0 -3.2 -3.4
-.4 .0 -.4 .3 .0 .0 -1.6 -1.7 .1 .2 .4 .8 -1.0 -.2 .1 -.9 -1.5 -2.3 -1.6 -.8 -1.2 -2.6 -1.3 -1.1 -1.7 -2.0 -1.8 -1.3 -.7 -1.1 -1.5 -.6 -.7 .2 .0
.9 .1 .4 -.5 -.8 -.9 -2.7 -2.4 -.3 .4 .3 .7 .1 .0 .3 .5 -.2 -.2 .2 -.6 -2.5 -2.5 -3.7 -3.5 -2.6 -1.7 -.7 -.9 -.6 .1 -.8 -.2 1.0 .6 -.1
.2 .9 .7 .0 .3 .0 .4 .7 .4 .7 1.0 .5 .8 1.2 .7 1.0 .7 .1 .0 1.1 .5 .6 2.4 2.3 2.0 1.2 .1 .0 .0 .3 .5 .2 .3 .9 1.4
1.4 2.2 1.4 1.5 1.5 .6 -.3 .3 -.2 -.7 .1 1.0 .8 .7 .0 .5 .9 .8 .3 .6 .1 -.8 1.5 .3 2.0 -.3 1.0 .0 -.5 .2 -.6 -.5 -.1 .7 1.8 .9
.7 1.0 .8 .4 .2 .3 .7 1.3 .9 .2 -2.0 -.8 .6 .3 -.5 -.9 -.2 .6 .0 .3 -.2 -1.2 -.5 .7 .9 -1.3 .7 -.2 .2 -.7 -.1 .2 -.5 .3 .2 1.5
1.7 .6 1.5 -1.0 -.4 -2.8 -3.1 1.5 .7 .6 -.5 .0 .7 1.7 .5 -.6 1.2 2.1 1.4 1.0 1.0 1.4 1.1 1.1 .5 -.1 .0 .3 .7 .8 .1 .5 -.3 .3 1.5 1.5
.0 .8 -.1 -.3 -1.2 2.3 3.0 2.9 .1 1.6 .6 .0 -.1 .4 .1 -.4 1.0 2.5 2.6 .4 1.2 2.6 1.1 1.1 4.1 2.3 1.5 1.2 .9 1.5 -.6 -.3 .0
.2 .5 .8 -.1 -.9 -1.5 -1.7 -.9 -.8 .0 1.1 .2 -2.3 .6 -.4 -1.1 -1.1 .7 -.5 .1 -1.2 -1.5 -3.1 -3.3 5.2 6.8 .0 -1.7 -1.2 -5.4 -6.4 -3.9 -3.8 -3.3 -2.3 -.3
-1.1 1.0 .6 1.2 .6 .5 -.2 .0 -.6 -2.1 -.9 -1.4 -1.4 -.9 .2 .4 -.6 .6 -.6 -1.1 -2.3 -1.8 -2.1 -.8 .4 -.6 .8 -.7 -.8 -3.1 -3.2 -2.9 -3.0 -3.2 -1.6 -3.0
-1.7 .3 .2 -.8 .5 -.6 .2 .2 -1.1 -1.5 -2.0 -1.5 -1.5 -1.7 -1.3 -.9 -.7 -1.4 -.6 -1.8 -3.5 -3.3 -2.7 -1.5 -.2 -.8 .2 -1.1 -1.5 -2.1 -3.9 -2.7 -2.4 -1.6 -.7 -1.9
-3.0 -1.4 -.9 -.9 -.9 -1.0 -.5 -.6 -1.3 -4.2 -2.5 -1.9 -1.8 -2.8

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
SEPTEMBER 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


7 5 5 4 6 6 6 8
7 6 7 7 6 5 5 5 6 7 7 7 7 10 8 8 9 7 7 8 6 7 5 6 6 5 8 7 6 7 11 12
10 6 6 6 6 5 6 6 6 6 6 7 8 8 6 7 8 8 8 6 6 7 6 7 7 7 7 7 7 7 9 10 8 9 7
6 6 5 5 5 8 7 7 6 6 6 6 5 6 6 5 6 8 7 6 8 7 7 8 9 6 6 8 6 6 7 8 6 7 7 6
6 5 4 4 7 6 6 6 6 6 7 7 7 7 6 9 5 5 5 6 6 5 7 8 9 8 7 6 6 7 7 6 6 7 7
6 6 5 6 6 6 6 6 6 6 6 7 5 5 5 5 5 5 6 6 6 6 7 7 11 10 11 8 6 7 7 7 6 6 6 6
5 5 6 6 6 7 6 6 6 6 6 6 5 5 5 5 6 6 6 6 6 6 7 7 10 10 10 8 6 7 6 6 5 5 5 5
6 5 6 10 11 9 7 6 5 5 6 5 5 6 8 4 7 7 7 7 7 6 7 7 8 9 7 7 7 6 5 5 5 5 6 6
6 6 6 6 8 8 7 11 5 5 6 6 7 6 6 6 6 8 7 9 8 8 7 6 13 7 7 8 7 8 8 6 6
7 7 7 7 7 6 7 7 7 7 7 7 10 9 8 7 7 8 8 7 9 9 9 9 19 20 7 10 9 12 12 12 10 10 9 9
10 8 7 7 7 7 6 7 6 7 8 7 9 11 11 8 8 8 8 7 8 11 8 7 7 7 8 10 9 10 9 9 8 9 8 9
6 6 5 6 7 8 7 7 6 6 6 6 6 8 9 8 9 9 8 8 9 9 9 8 9 9 9 8 9 8 8 8 7 7 6 7
9 9 10 10 8 7 10 8 9 11 9 10 9 9

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: September 1999

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :All soundings.

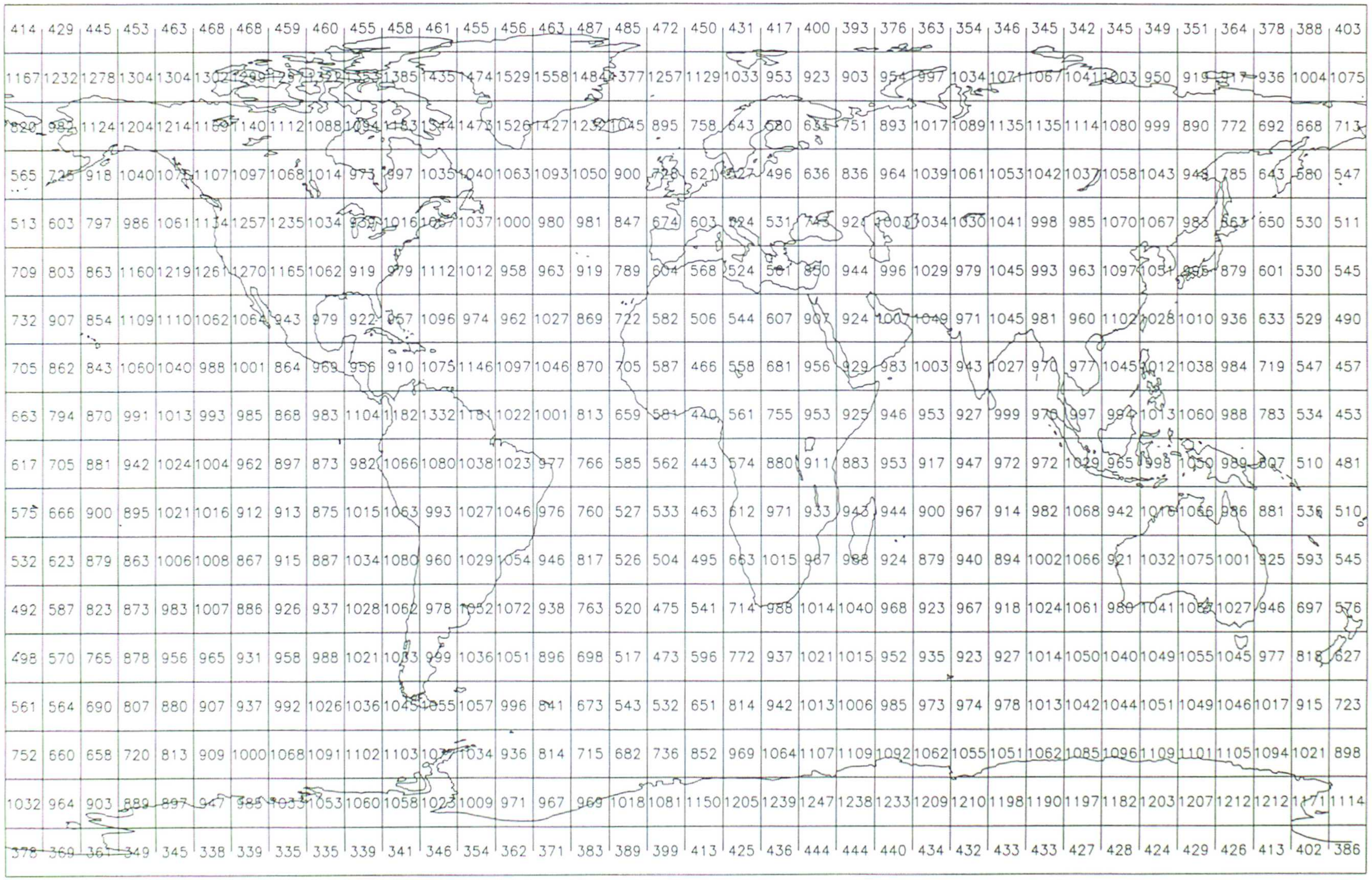
Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

- HIRS8 (Surface)
- HIRS15 (700)
- HIRS11 (500-700)
- HIRS4 (400)
- AMSUA5 (700)
- AMSUA7 (300)
- AMSUA9 (100)

:Mean and standard deviation observation-minus-background brightness temperature differences

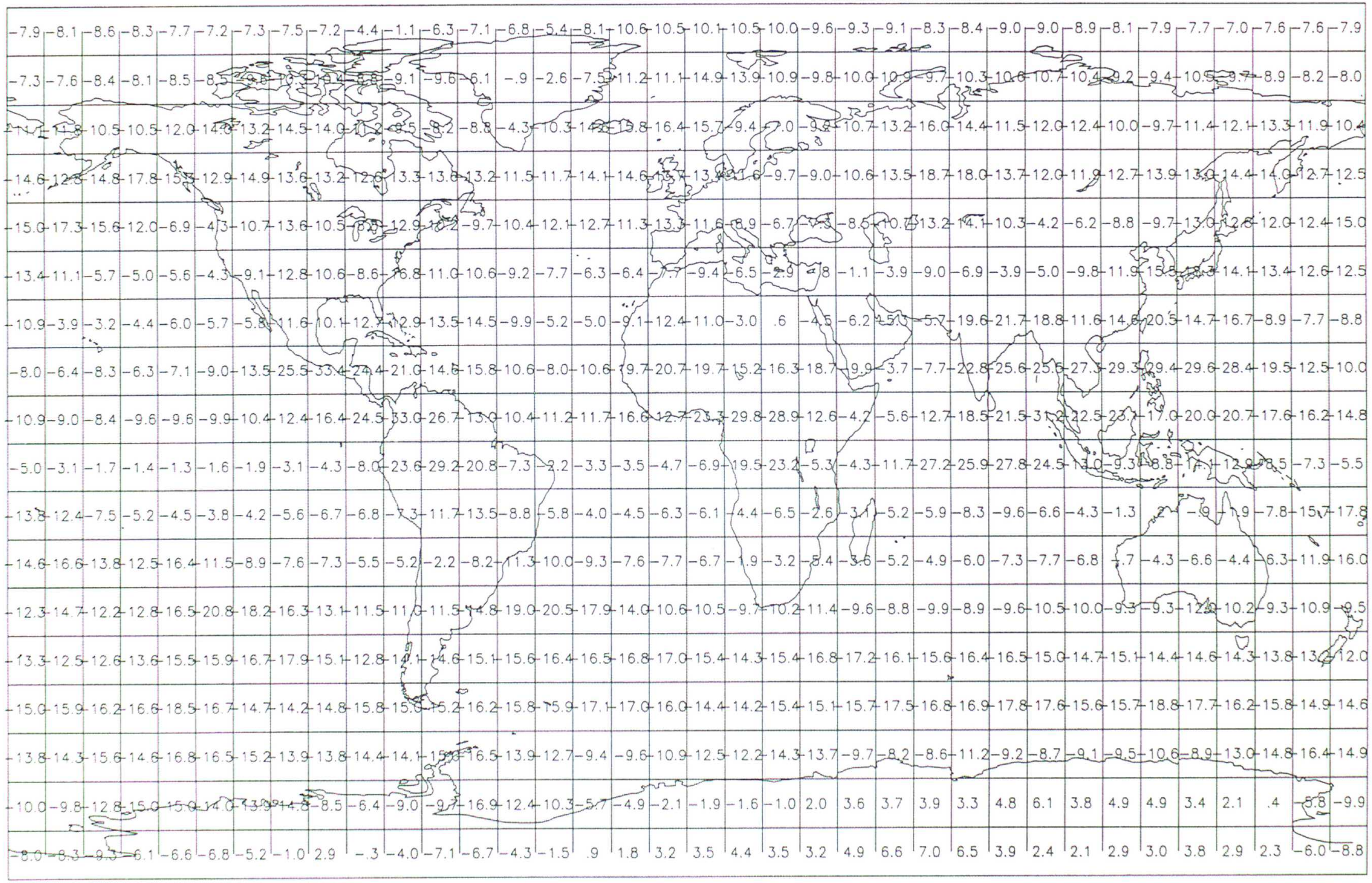
ATOVS : MEAN DAILY NUMBER OF OBSERVATIONS
SEPTEMBER 1999
NOAA−15, USING ALL OBSERVATIONS

FIGURE 25



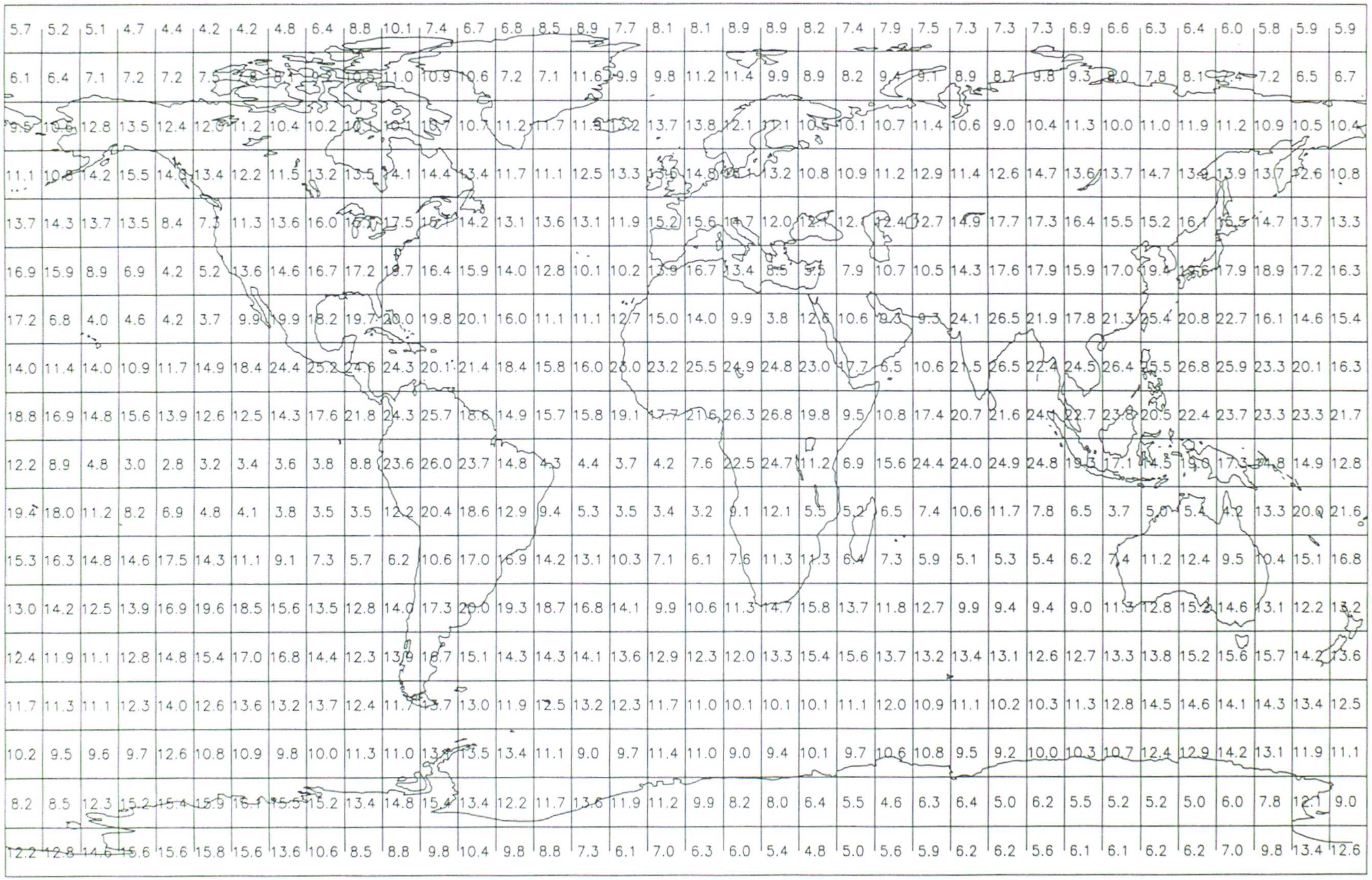
414	429	445	453	463	468	468	459	460	455	458	461	455	456	463	487	485	472	450	431	417	400	393	376	363	354	346	345	342	345	349	351	364	378	388	403
1167	1232	1278	1304	1304	1302	1299	1297	1322	1353	1385	1435	1474	1529	1558	1484	1377	1257	1129	1033	953	923	903	954	997	1034	1071	1067	1041	1003	950	919	917	936	1004	1075
820	982	1124	1204	1214	1169	1140	1112	1088	1094	1183	1344	1473	1526	1427	1232	1045	895	758	643	680	635	751	893	1017	1089	1135	1135	1114	1080	999	890	772	692	668	713
565	725	918	1040	1075	1107	1097	1068	1014	973	997	1035	1040	1063	1093	1050	900	728	621	627	496	636	836	964	1039	1061	1053	1042	1037	1058	1043	948	785	643	580	547
513	603	797	986	1061	1134	1257	1235	1034	939	1016	1057	1037	1000	980	981	847	674	603	924	531	743	924	1003	1034	1030	1041	998	985	1070	1067	983	863	650	530	511
709	803	863	1160	1219	1261	1270	1165	1062	919	979	1112	1012	958	963	919	789	604	568	524	561	850	944	996	1029	979	1045	993	963	1097	1051	995	879	601	530	545
732	907	854	1109	1110	1062	1064	943	979	922	957	1096	974	962	1027	869	722	582	506	544	607	907	924	1007	1049	971	1045	981	960	1102	1028	1010	936	633	529	490
705	862	843	1060	1040	988	1001	864	969	956	910	1075	1146	1097	1046	870	705	587	466	558	681	956	929	983	1003	943	1027	970	977	1045	1012	1038	984	719	547	457
663	794	870	991	1013	993	985	868	983	1104	1182	1332	1181	1022	1001	813	659	581	440	561	755	953	925	946	953	927	999	970	997	994	1013	1060	988	783	534	453
617	705	881	942	1024	1004	962	897	873	982	1066	1080	1038	1023	977	766	585	562	443	574	880	911	883	953	917	947	972	972	1029	965	998	1050	989	807	510	481
575	666	900	895	1021	1016	912	913	875	1015	1063	993	1027	1046	976	760	527	533	463	612	971	933	943	944	900	967	914	982	1068	942	1016	1066	986	881	536	510
532	623	879	863	1006	1008	867	915	887	1034	1080	960	1029	1054	946	817	526	504	495	663	1015	987	988	924	879	940	894	1002	1066	921	1032	1075	1001	925	593	545
492	587	823	873	983	1007	886	926	937	1028	1062	978	1052	1072	938	763	520	475	541	714	988	1014	1040	968	923	967	918	1024	1061	980	1041	1082	1027	946	697	576
498	570	765	878	956	965	931	958	988	1021	1033	999	1036	1051	896	698	517	473	596	772	937	1021	1015	952	935	923	927	1014	1050	1040	1049	1055	1045	977	818	627
561	564	690	807	880	907	937	992	1026	1036	1045	1055	1057	996	841	673	543	532	651	814	942	1013	1006	985	973	974	978	1013	1042	1044	1051	1049	1046	1017	915	723
752	660	658	720	813	909	1000	1068	1091	1102	1103	1037	1034	936	814	715	682	736	852	969	1064	1107	1109	1092	1062	1055	1051	1062	1085	1096	1109	1101	1105	1094	1021	898
1032	964	903	889	897	947	985	1033	1053	1060	1058	1023	1009	971	967	969	1018	1081	1150	1205	1239	1247	1238	1233	1209	1210	1198	1190	1197	1182	1203	1207	1212	1212	1171	1114
378	369	361	349	345	338	339	335	335	339	341	346	354	362	371	383	389	399	413	425	436	444	444	440	434	432	433	433	427	428	424	429	426	413	402	386

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C) FIGURE 26
SEPTEMBER 1999 : HIRS8 channel (Surface)
NOAA-15, USING ALL OBSERVATIONS


-7.9 -8.1 -8.6 -8.3 -7.7 -7.2 -7.3 -7.5 -7.2 -4.4 -1.1 -6.3 -7.1 -6.8 -5.4 -8.1 -10.6 -10.5 -10.1 -10.5 -10.0 -9.6 -9.3 -9.1 -8.3 -8.4 -9.0 -9.0 -8.9 -8.1 -7.9 -7.7 -7.0 -7.6 -7.6 -7.9
-7.3 -7.6 -8.4 -8.1 -8.5 -8.5 -9.6 -10.3 -10.4 -8.8 -9.1 -9.6 -6.1 -.9 -2.6 -7.5 -11.2 -11.1 -14.9 -13.9 -10.9 -9.8 -10.0 -10.9 -9.7 -10.3 -10.6 -10.7 -10.4 -9.2 -9.4 -10.5 -9.7 -8.9 -8.2 -8.0
-11.1 -11.8 -10.5 -10.5 -12.0 -14.0 -13.2 -14.5 -14.0 -11.2 -8.5 -8.2 -8.8 -4.3 -10.3 [illegible] -15.8 -16.4 -15.7 -9.4 -7.0 -9.2 -10.7 -13.2 -16.0 -14.4 -11.5 -12.0 -12.4 -10.0 -9.7 -11.4 -12.1 -13.3 -11.9 -10.4
-14.6 -12.8 -14.8 -17.8 -15.3 -12.9 -14.9 -13.6 -13.2 -12.6 -13.3 -13.8 -13.2 -11.5 -11.7 -14.1 -14.6 -13.7 -13.4 -11.6 -9.7 -9.0 -10.6 -13.5 -18.7 -18.0 -13.7 -12.0 -11.9 -12.7 -13.9 -13.0 -14.4 -14.0 -12.7 -12.5
-15.0 -17.3 -15.6 -12.0 -6.9 -4.3 -10.7 -13.6 -10.5 -8.8 -12.9 -10.2 -9.7 -10.4 -12.1 -12.7 -11.3 -13.3 -11.6 -8.9 -6.7 -7.3 -8.5 -10.7 -13.2 -14.1 -10.3 -4.2 -6.2 -8.8 -9.7 -13.0 -12.6 -12.0 -12.4 -15.0
-13.4 -11.1 -5.7 -5.0 -5.6 -4.3 -9.1 -12.8 -10.6 -8.6 -16.8 -11.0 -10.6 -9.2 -7.7 -6.3 -6.4 -7.7 -9.4 -6.5 -2.9 8 -1.1 -3.9 -9.0 -6.9 -3.9 -5.0 -9.8 -11.9 -15.5 -18.3 -14.1 -13.4 -12.6 -12.5
-10.9 -3.9 -3.2 -4.4 -6.0 -5.7 -5.8 -11.6 -10.1 -12.7 -12.9 -13.5 -14.5 -9.9 -5.2 -5.0 -9.1 -12.4 -11.0 -3.0 .6 -4.5 -6.2 -15.3 -5.7 -19.6 -21.7 -18.8 -11.6 -14.6 -20.5 -14.7 -16.7 -8.9 -7.7 -8.8
-8.0 -6.4 -8.3 -6.3 -7.1 -9.0 -13.5 -25.5 -33.4 -24.4 -21.0 -14.6 -15.8 -10.6 -8.0 -10.6 -19.7 -20.7 -19.7 -15.2 -16.3 -18.7 -9.9 -3.7 -7.7 -22.8 -25.6 -25.5 -27.3 -29.3 -29.4 -29.6 -28.4 -19.5 -12.5 -10.0
-10.9 -9.0 -8.4 -9.6 -9.6 -9.9 -10.4 -12.4 -16.4 -24.5 -33.0 -26.7 -13.0 -10.4 -11.2 -11.7 -16.6 -12.7 -23.3 -29.8 -28.9 -12.6 -4.2 -5.6 -12.7 -18.5 -21.5 -31.2 -22.5 -23.1 -17.0 -20.0 -20.7 -17.6 -16.2 -14.8
-5.0 -3.1 -1.7 -1.4 -1.3 -1.6 -1.9 -3.1 -4.3 -8.0 -23.6 -29.2 -20.8 -7.3 -2.2 -3.3 -3.5 -4.7 -6.9 -19.5 -23.2 -5.3 -4.3 -11.7 -27.2 -25.9 -27.8 -24.5 -13.0 -9.3 -8.8 -14.1 -12.9 -8.5 -7.3 -5.5
-13.8 -12.4 -7.5 -5.2 -4.5 -3.8 -4.2 -5.6 -6.7 -6.8 -7.3 -11.7 -13.5 -8.8 -5.8 -4.0 -4.5 -6.3 -6.1 -4.4 -6.5 -2.6 -3.1 -5.2 -5.9 -8.3 -9.6 -6.6 -4.3 -1.3 2 -.9 -1.9 -7.8 -15.7 -17.8
-14.6 -16.6 -13.8 -12.5 -16.4 -11.5 -8.9 -7.6 -7.3 -5.5 -5.2 -2.2 -8.2 -11.3 -10.0 -9.3 -7.6 -7.7 -6.7 -1.9 -3.2 -5.4 -3.6 -5.2 -4.9 -6.0 -7.3 -7.7 -6.8 -.7 -4.3 -6.6 -4.4 -6.3 -11.9 -16.0
-12.3 -14.7 -12.2 -12.8 -16.5 -20.8 -18.2 -16.3 -13.1 -11.5 -11.0 -11.5 -14.8 -19.0 -20.5 -17.9 -14.0 -10.6 -10.5 -9.7 -10.2 -11.4 -9.6 -8.8 -9.9 -8.9 -9.6 -10.5 -10.0 -9.3 -9.3 -12.0 -10.2 -9.3 -10.9 -9.5
-13.3 -12.5 -12.6 -13.6 -15.5 -15.9 -16.7 -17.9 -15.1 -12.8 -14.1 -14.6 -15.1 -15.6 -16.4 -16.5 -16.8 -17.0 -15.4 -14.3 -15.4 -16.8 -17.2 -16.1 -15.6 -16.4 -16.5 -15.0 -14.7 -15.1 -14.4 -14.6 -14.3 -13.8 -13.2 -12.0
-15.0 -15.9 -16.2 -16.6 -18.5 -16.7 -14.7 -14.2 -14.8 -15.8 -15.0 -15.2 -16.2 -15.8 -15.9 -17.1 -17.0 -16.0 -14.4 -14.2 -15.4 -15.1 -15.7 -17.5 -16.8 -16.9 -17.8 -17.6 -15.6 -15.7 -18.8 -17.7 -16.2 -15.8 -14.9 -14.6
-13.8 -14.3 -15.6 -14.6 -16.8 -16.5 -15.2 -13.9 -13.8 -14.4 -14.1 -15.0 -16.5 -13.9 -12.7 -9.4 -9.6 -10.9 -12.5 -12.2 -14.3 -13.7 -9.7 -8.2 -8.6 -11.2 -9.2 -8.7 -9.1 -9.5 -10.6 -8.9 -13.0 -14.8 -16.4 -14.9
-10.0 -9.8 -12.8 -15.0 -15.0 -14.0 -13.9 -14.8 -8.5 -6.4 -9.0 -9.7 -16.9 -12.4 -10.3 -5.7 -4.9 -2.1 -1.9 -1.6 -1.0 2.0 3.6 3.7 3.9 3.3 4.8 6.1 3.8 4.9 4.9 3.4 2.1 .4 -5.8 -9.9
-8.0 -8.3 -9.3 -6.1 -6.6 -6.8 -5.2 -1.0 2.9 -.3 -4.0 -7.1 -6.7 -4.3 -1.5 .9 1.8 3.2 3.5 4.4 3.5 3.2 4.9 6.6 7.0 6.5 3.9 2.4 2.1 2.9 3.0 3.8 2.9 2.3 -6.0 -8.8

ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
SEPTEMBER 1999 : HIRS8 channel (Surface)
NOAA–15, USING ALL OBSERVATIONS

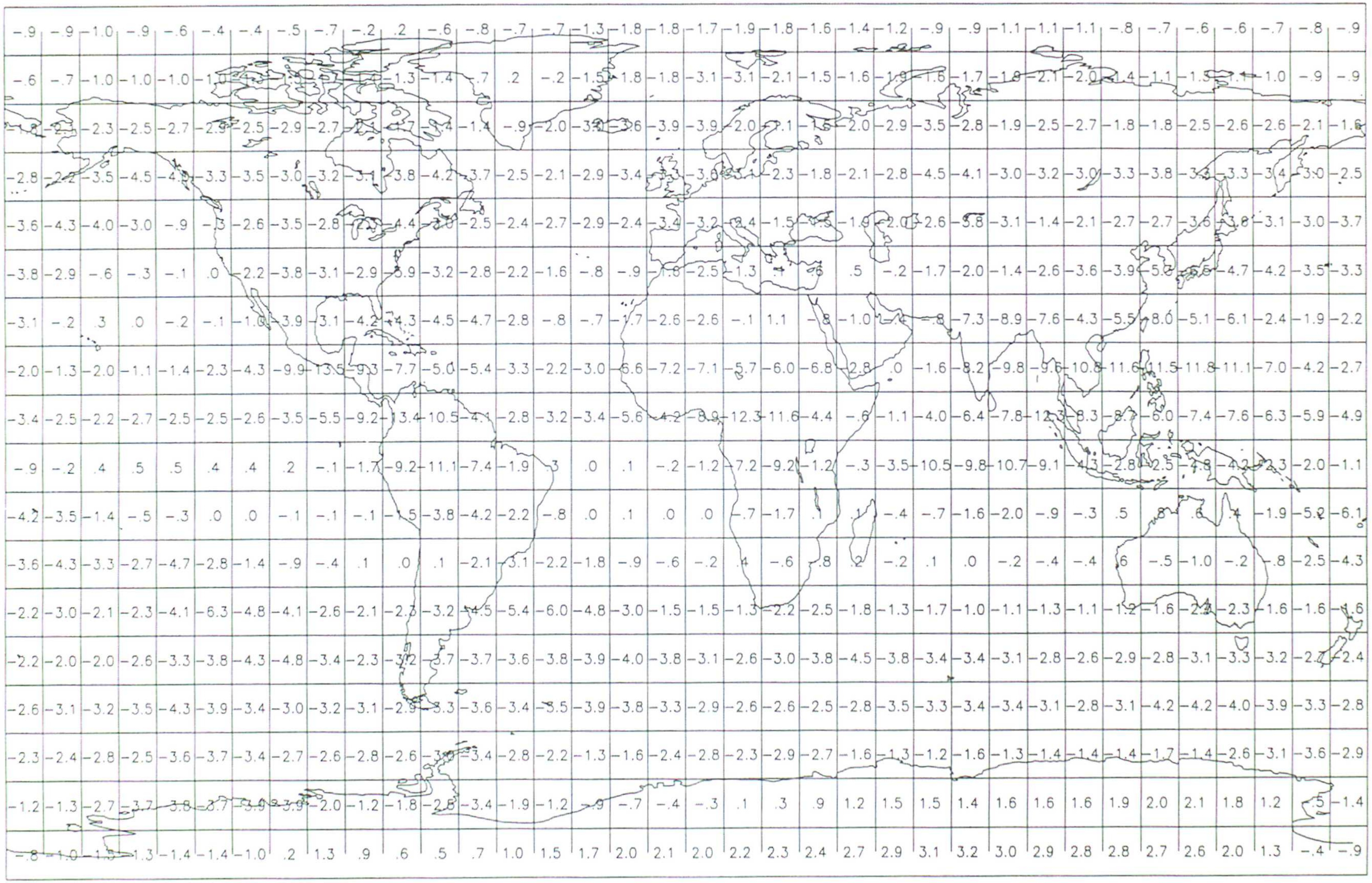
FIGURE 27



5.7	5.2	5.1	4.7	4.4	4.2	4.2	4.8	6.4	8.8	10.1	7.4	6.7	6.8	8.5	8.9	7.7	8.1	8.1	8.9	8.9	8.2	7.4	7.9	7.5	7.3	7.3	7.3	6.9	6.6	6.3	6.4	6.0	5.8	5.9	5.9
6.1	6.4	7.1	7.2	7.2	7.5	7.8	8.1	9.2	10.5	11.0	10.9	10.6	7.2	7.1	11.6	9.9	9.8	11.2	11.4	9.9	8.9	8.2	9.4	9.1	8.9	8.7	9.8	9.3	8.0	7.8	8.1	7.4	7.2	6.5	6.7
9.5	10.6	12.8	13.5	12.4	12.0	11.2	10.4	10.2	10.1	10.1	10.7	10.7	11.2	11.7	11.3	13.2	13.7	13.8	12.1	11.1	10.5	10.1	10.7	11.4	10.6	9.0	10.4	11.3	10.0	11.0	11.9	11.2	10.9	10.5	10.4
11.1	10.8	14.2	15.5	14.0	13.4	12.2	11.5	13.2	13.5	14.1	14.4	13.4	11.7	11.1	12.5	13.3	13.6	14.8	15.1	13.2	10.8	10.9	11.2	12.9	11.4	12.6	14.7	13.6	13.7	14.7	13.4	13.9	13.7	12.6	10.8
13.7	14.3	13.7	13.5	8.4	7.3	11.3	13.6	16.0	16.2	17.5	15.1	14.2	13.1	13.6	13.1	11.9	15.2	15.6	14.7	12.0	12.1	12.1	12.4	12.7	14.9	17.7	17.3	16.4	15.5	15.2	16.1	16.5	14.7	13.7	13.3
16.9	15.9	8.9	6.9	4.2	5.2	13.6	14.6	16.7	17.2	18.7	16.4	15.9	14.0	12.8	10.1	10.2	13.9	16.7	13.4	8.5	9.5	7.9	10.7	10.5	14.3	17.6	17.9	15.9	17.0	19.4	18.6	17.9	18.9	17.2	16.3
17.2	6.8	4.0	4.6	4.2	3.7	9.9	19.9	18.2	19.7	20.0	19.8	20.1	16.0	11.1	11.1	12.7	15.0	14.0	9.9	3.8	12.6	10.6	9.3	9.3	24.1	26.5	21.9	17.8	21.3	25.4	20.8	22.7	16.1	14.6	15.4
14.0	11.4	14.0	10.9	11.7	14.9	18.4	24.4	25.2	24.6	24.3	20.1	21.4	18.4	15.8	16.0	26.0	23.2	25.5	24.9	24.8	23.0	17.7	6.5	10.6	21.5	26.5	22.4	24.5	26.4	25.5	26.8	25.9	23.3	20.1	16.3
18.8	16.9	14.8	15.6	13.9	12.6	12.5	14.3	17.6	21.8	24.3	25.7	18.6	14.9	15.7	15.8	19.1	17.7	21.6	26.3	26.8	19.8	9.5	10.8	17.4	20.7	21.6	24.1	22.7	23.8	20.5	22.4	23.7	23.3	23.3	21.7
12.2	8.9	4.8	3.0	2.8	3.2	3.4	3.6	3.8	8.8	23.6	26.0	23.7	14.8	4.3	4.4	3.7	4.2	7.6	22.5	24.7	11.2	6.9	15.6	24.4	24.0	24.9	24.8	19.3	17.1	14.5	19.0	17.3	14.8	14.9	12.8
19.4	18.0	11.2	8.2	6.9	4.8	4.1	3.8	3.5	3.5	12.2	20.4	18.6	12.9	9.4	5.3	3.5	3.4	3.2	9.1	12.1	5.5	5.2	6.5	7.4	10.6	11.7	7.8	6.5	3.7	5.0	5.4	4.2	13.3	20.0	21.6
15.3	16.3	14.8	14.6	17.5	14.3	11.1	9.1	7.3	5.7	6.2	10.6	17.0	16.9	14.2	13.1	10.3	7.1	6.1	7.6	11.3	11.3	6.4	7.3	5.9	5.1	5.3	5.4	6.2	7.4	11.2	12.4	9.5	10.4	15.1	16.8
13.0	14.2	12.5	13.9	16.9	19.6	18.5	15.6	13.5	12.8	14.0	17.3	20.0	19.3	18.7	16.8	14.1	9.9	10.6	11.3	14.7	15.8	13.7	11.8	12.7	9.9	9.4	9.4	9.0	11.3	12.8	15.2	14.6	13.1	12.2	13.2
12.4	11.9	11.1	12.8	14.8	15.4	17.0	16.8	14.4	12.3	13.9	16.7	15.1	14.3	14.3	14.1	13.6	12.9	12.3	12.0	13.3	15.4	15.6	13.7	13.2	13.4	13.1	12.6	12.7	13.3	13.8	15.2	15.6	15.7	14.2	13.6
11.7	11.3	11.1	12.3	14.0	12.6	13.6	13.2	13.7	12.4	11.7	13.7	13.0	11.9	12.5	13.2	12.3	11.7	11.0	10.1	10.1	10.1	11.1	12.0	10.9	11.1	10.2	10.3	11.3	12.8	14.5	14.6	14.1	14.3	13.4	12.5
10.2	9.5	9.6	9.7	12.6	10.8	10.9	9.8	10.0	11.3	11.0	13.1	13.5	13.4	11.1	9.0	9.7	11.4	11.0	9.0	9.4	10.1	9.7	10.6	10.8	9.5	9.2	10.0	10.3	10.7	12.4	12.9	14.2	13.1	11.9	11.1
8.2	8.5	12.3	15.2	15.4	15.9	16.1	15.5	15.2	13.4	14.8	15.4	13.4	12.2	11.7	13.6	11.9	11.2	9.9	8.2	8.0	6.4	5.5	4.6	6.3	6.4	5.0	6.2	5.5	5.2	5.2	5.0	6.0	7.8	12.1	9.0
12.2	12.8	14.6	15.6	15.6	15.8	15.6	13.6	10.6	8.5	8.8	9.8	10.4	9.8	8.8	7.3	6.1	7.0	6.3	6.0	5.4	4.8	5.0	5.6	5.9	6.2	6.2	5.6	6.1	6.1	6.2	6.2	7.0	9.8	13.4	12.6

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
SEPTEMBER 1999 : HIRS15 Channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 28

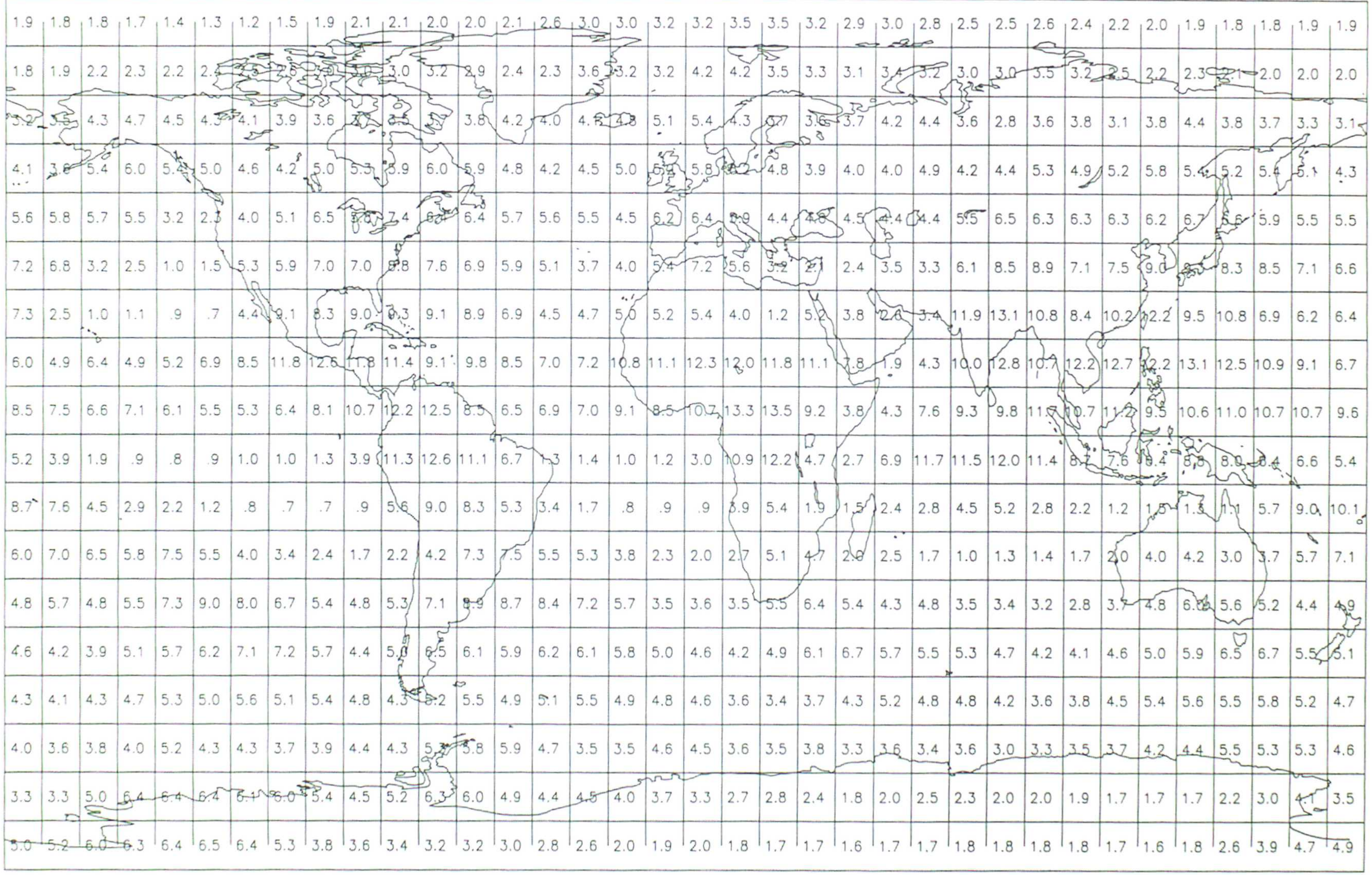

-.9 -.9 -1.0 -.9 -.6 -.4 -.4 -.5 -.7 -.2 .2 -.6 -.8 -.7 -.7 -1.3 -1.8 -1.8 -1.7 -1.9 -1.8 -1.6 -1.4 -1.2 -.9 -.9 -1.1 -1.1 -1.1 -.8 -.7 -.6 -.6 -.7 -.8 -.9
-.6 -.7 -1.0 -1.0 -1.0 -1.0 [illegible] -1.5 [illegible] -1.4 -1.3 -1.4 -.7 .2 -.2 -1.5 -1.8 -1.8 -3.1 -3.1 -2.1 -1.5 -1.6 -1.9 -1.6 -1.7 -1.8 -2.1 -2.0 -1.4 -1.1 -1.5 -1.1 -1.0 -.9 -.9
-1.8 -2.1 -2.3 -2.5 -2.7 -2.9 -2.5 -2.9 -2.7 -2.1 -1.7 -1.4 -1.4 -.9 -2.0 -3.3 -3.6 -3.9 -3.9 -2.0 -2.1 -1.5 -2.0 -2.9 -3.5 -2.8 -1.9 -2.5 -2.7 -1.8 -1.8 -2.5 -2.6 -2.6 -2.1 -1.6
-2.8 -2.2 -3.5 -4.5 -4.5 -3.3 -3.5 -3.0 -3.2 -3.1 -3.8 -4.2 -3.7 -2.5 -2.1 -2.9 -3.4 -3.3 -3.6 -3.1 -2.3 -1.8 -2.1 -2.8 -4.5 -4.1 -3.0 -3.2 -3.0 -3.3 -3.8 -3.3 -3.3 -3.4 -3.0 -2.5
-3.6 -4.3 -4.0 -3.0 -.9 -.3 -2.6 -3.5 -2.8 -2.3 -4.4 -3.0 -2.5 -2.4 -2.7 -2.9 -2.4 -3.4 -3.2 -2.4 -1.5 -1.5 -1.9 -2.0 -2.6 -3.8 -3.1 -1.4 -2.1 -2.7 -2.7 -3.6 -3.8 -3.1 -3.0 -3.7
-3.8 -2.9 -.6 -.3 -.1 .0 -2.2 -3.8 -3.1 -2.9 -3.9 -3.2 -2.8 -2.2 -1.6 -.8 -.9 -1.8 -2.5 -1.3 .1 .6 .5 -.2 -1.7 -2.0 -1.4 -2.6 -3.6 -3.9 -5.0 [illegible] -4.7 -4.2 -3.5 -3.3
-3.1 -.2 .3 .0 -.2 -.1 -1.0 -3.9 -3.1 -4.2 -4.3 -4.5 -4.7 -2.8 -.8 -.7 -1.7 -2.6 -2.6 -.1 1.1 -.8 -1.0 -.4 -.8 -7.3 -8.9 -7.6 -4.3 -5.5 -8.0 -5.1 -6.1 -2.4 -1.9 -2.2
-2.0 -1.3 -2.0 -1.1 -1.4 -2.3 -4.3 -9.9 -13.5 -9.3 -7.7 -5.0 -5.4 -3.3 -2.2 -3.0 -6.6 -7.2 -7.1 -5.7 -6.0 -6.8 -2.8 .0 -1.6 -8.2 -9.8 -9.6 -10.8 -11.6 -11.5 -11.8 -11.1 -7.0 -4.2 -2.7
-3.4 -2.5 -2.2 -2.7 -2.5 -2.5 -2.6 -3.5 -5.5 -9.2 -13.4 -10.5 -4.1 -2.8 -3.2 -3.4 -5.6 -4.2 -8.9 -12.3 -11.6 -4.4 -.6 -1.1 -4.0 -6.4 -7.8 -12.3 -8.3 -8.7 -6.0 -7.4 -7.6 -6.3 -5.9 -4.9
-.9 -.2 .4 .5 .5 .4 .4 .2 -.1 -1.7 -9.2 -11.1 -7.4 -1.9 .3 .0 .1 -.2 -1.2 -7.2 -9.2 -1.2 -.3 -3.5 -10.5 -9.8 -10.7 -9.1 -4.3 -2.8 -2.5 -4.8 -4.2 -2.3 -2.0 -1.1
-4.2 -3.5 -1.4 -.5 -.3 .0 .0 -.1 -.1 -.1 -1.5 -3.8 -4.2 -2.2 -.8 .0 .1 .0 .0 -.7 -1.7 .1 .1 -.4 -.7 -1.6 -2.0 -.9 -.3 .5 .8 .6 .4 -1.9 -5.2 -6.1
-3.6 -4.3 -3.3 -2.7 -4.7 -2.8 -1.4 -.9 -.4 .1 .0 .1 -2.1 -3.1 -2.2 -1.8 -.9 -.6 -.2 .4 -.6 .8 .2 -.2 .1 .0 -.2 -.4 -.4 .6 -.5 -1.0 -.2 .8 -2.5 -4.3
-2.2 -3.0 -2.1 -2.3 -4.1 -6.3 -4.8 -4.1 -2.6 -2.1 -2.3 -3.2 -4.5 -5.4 -6.0 -4.8 -3.0 -1.5 -1.5 -1.3 -2.2 -2.5 -1.8 -1.3 -1.7 -1.0 -1.1 -1.3 -1.1 -1.2 -1.6 -2.3 -2.3 -1.6 -1.6 -1.6
-2.2 -2.0 -2.0 -2.6 -3.3 -3.8 -4.3 -4.8 -3.4 -2.3 -3.2 -3.7 -3.7 -3.6 -3.8 -3.9 -4.0 -3.8 -3.1 -2.6 -3.0 -3.8 -4.5 -3.8 -3.4 -3.4 -3.1 -2.8 -2.6 -2.9 -2.8 -3.1 -3.3 -3.2 -2.7 -2.4
-2.6 -3.1 -3.2 -3.5 -4.3 -3.9 -3.4 -3.0 -3.2 -3.1 -2.9 -3.3 -3.6 -3.4 -3.5 -3.9 -3.8 -3.3 -2.9 -2.6 -2.6 -2.5 -2.8 -3.5 -3.3 -3.4 -3.4 -3.1 -2.8 -3.1 -4.2 -4.2 -4.0 -3.9 -3.3 -2.8
-2.3 -2.4 -2.8 -2.5 -3.6 -3.7 -3.4 -2.7 -2.6 -2.8 -2.6 -3.0 -3.4 -2.8 -2.2 -1.3 -1.6 -2.4 -2.8 -2.3 -2.9 -2.7 -1.6 -1.3 -1.2 -1.6 -1.3 -1.4 -1.4 -1.4 -1.7 -1.4 -2.6 -3.1 -3.6 -2.9
-1.2 -1.3 -2.7 -3.7 -3.8 -3.7 -3.9 -3.9 -2.0 -1.2 -1.8 -2.8 -3.4 -1.9 -1.2 -.9 -.7 -.4 -.3 .1 .3 .9 1.2 1.5 1.5 1.4 1.6 1.6 1.6 1.9 2.0 2.1 1.8 1.2 -.5 -1.4
-.8 -1.0 -1.5 -1.3 -1.4 -1.4 -1.0 .2 1.3 .9 .6 .5 .7 1.0 1.5 1.7 2.0 2.1 2.0 2.2 2.3 2.4 2.7 2.9 3.1 3.2 3.0 2.9 2.8 2.8 2.7 2.6 2.0 1.3 -.4 -.9

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)

SEPTEMBER 1999 : HIRS15 channel (700 hPa)

NOAA-15, USING ALL OBSERVATIONS

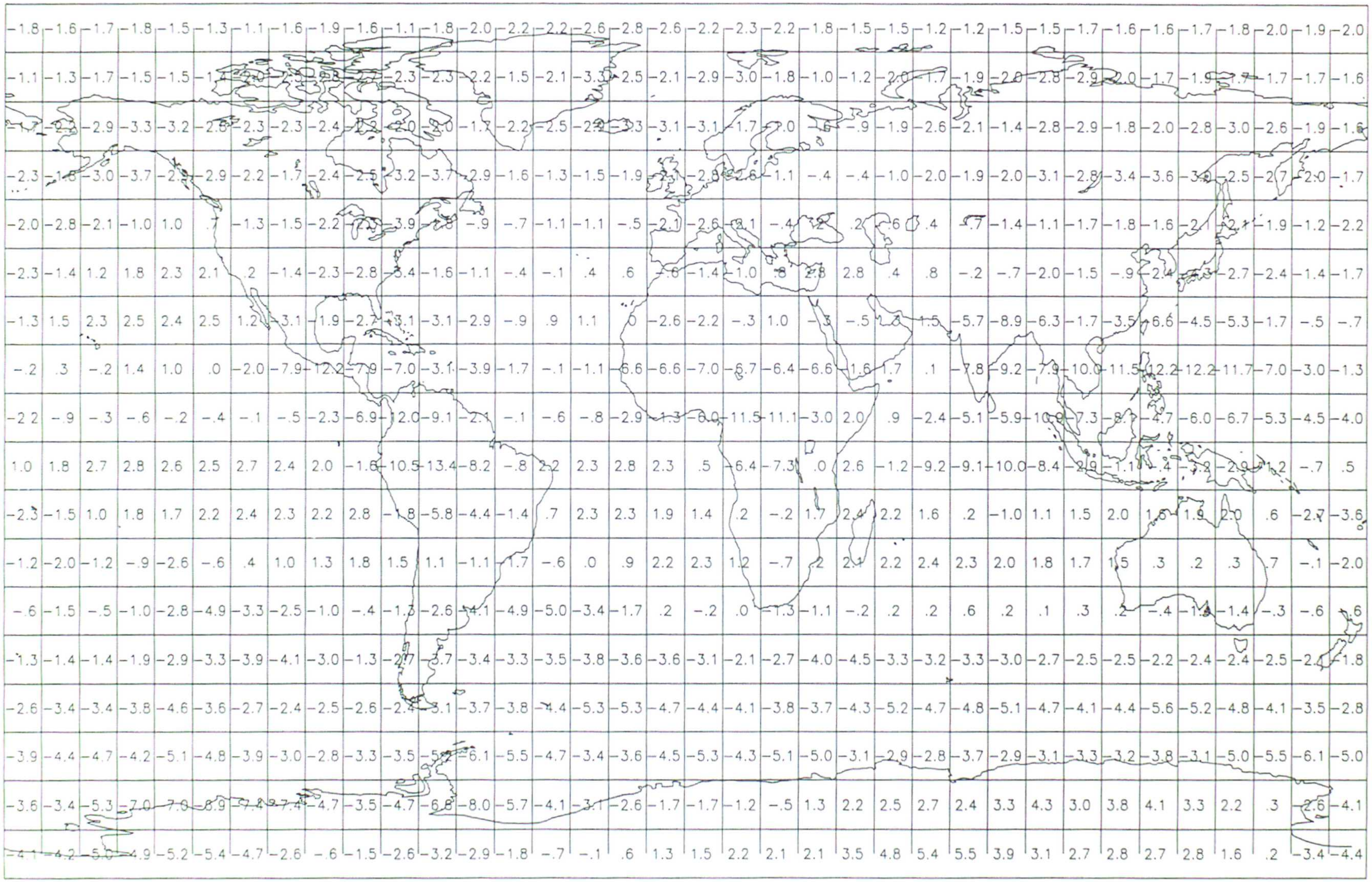
FIGURE 29



1.9	1.8	1.8	1.7	1.4	1.3	1.2	1.5	1.9	2.1	2.1	2.0	2.0	2.1	2.6	3.0	3.0	3.2	3.2	3.5	3.5	3.2	2.9	3.0	2.8	2.5	2.5	2.6	2.4	2.2	2.0	1.9	1.8	1.8	1.9	1.9
1.8	1.9	2.2	2.3	2.2	2.4	2.5	2.6	3.0	3.0	3.0	3.2	2.9	2.4	2.3	3.6	3.2	3.2	4.2	4.2	3.5	3.3	3.1	3.4	3.2	3.0	3.0	3.5	3.2	2.5	2.2	2.3	2.1	2.0	2.0	2.0
3.2	3.5	4.3	4.7	4.5	4.3	4.1	3.9	3.6	3.7	3.5	3.7	3.8	4.2	4.0	4.7	4.8	5.1	5.4	4.3	3.7	3.6	3.7	4.2	4.4	3.6	2.8	3.6	3.8	3.1	3.8	4.4	3.8	3.7	3.3	3.1
4.1	3.6	5.4	6.0	5.4	5.0	4.6	4.2	5.0	5.3	5.9	6.0	5.9	4.8	4.2	4.5	5.0	5.9	5.8	4.2	4.8	3.9	4.0	4.0	4.9	4.2	4.4	5.3	4.9	5.2	5.8	5.4	5.2	5.4	5.1	4.3
5.6	5.8	5.7	5.5	3.2	2.3	4.0	5.1	6.5	3.8	7.4	6.4	6.4	5.7	5.6	5.5	4.5	6.2	6.4	3.9	4.4	4.8	4.5	4.4	4.4	5.5	6.5	6.3	6.3	6.3	6.2	6.7	5.6	5.9	5.5	5.5
7.2	6.8	3.2	2.5	1.0	1.5	5.3	5.9	7.0	7.0	8.8	7.6	6.9	5.9	5.1	3.7	4.0	5.4	7.2	5.6	3.2	2.1	2.4	3.5	3.3	6.1	8.5	8.9	7.1	7.5	9.0	8.3	8.3	8.5	7.1	6.6
7.3	2.5	1.0	1.1	.9	.7	4.4	9.1	8.3	9.0	9.3	9.1	8.9	6.9	4.5	4.7	5.0	5.2	5.4	4.0	1.2	5.2	3.8	2.6	3.4	11.9	13.1	10.8	8.4	10.2	12.2	9.5	10.8	6.9	6.2	6.4
6.0	4.9	6.4	4.9	5.2	6.9	8.5	11.8	12.6	11.8	11.4	9.1	9.8	8.5	7.0	7.2	10.8	11.1	12.3	12.0	11.8	11.1	7.8	1.9	4.3	10.0	12.8	10.7	12.2	12.7	12.2	13.1	12.5	10.9	9.1	6.7
8.5	7.5	6.6	7.1	6.1	5.5	5.3	6.4	8.1	10.7	12.2	12.5	8.5	6.5	6.9	7.0	9.1	8.5	10.7	13.3	13.5	9.2	3.8	4.3	7.6	9.3	9.8	11.7	10.7	11.2	9.5	10.6	11.0	10.7	10.7	9.6
5.2	3.9	1.9	.9	.8	.9	1.0	1.0	1.3	3.9	11.3	12.6	11.1	6.7	1.3	1.4	1.0	1.2	3.0	10.9	12.2	4.7	2.7	6.9	11.7	11.5	12.0	11.4	8.7	7.6	8.4	8.8	8.0	8.4	6.6	5.4
8.7	7.6	4.5	2.9	2.2	1.2	.8	.7	.7	.9	5.6	9.0	8.3	5.3	3.4	1.7	.8	.9	.9	3.9	5.4	1.9	1.5	2.4	2.8	4.5	5.2	2.8	2.2	1.2	1.5	1.3	1.1	5.7	9.0	10.1
6.0	7.0	6.5	5.8	7.5	5.5	4.0	3.4	2.4	1.7	2.2	4.2	7.3	7.5	5.5	5.3	3.8	2.3	2.0	2.7	5.1	4.7	2.0	2.5	1.7	1.0	1.3	1.4	1.7	2.0	4.0	4.2	3.0	3.7	5.7	7.1
4.8	5.7	4.8	5.5	7.3	9.0	8.0	6.7	5.4	4.8	5.3	7.1	8.9	8.7	8.4	7.2	5.7	3.5	3.6	3.5	5.5	6.4	5.4	4.3	4.8	3.5	3.4	3.2	2.8	3.7	4.8	6.0	5.6	5.2	4.4	4.9
4.6	4.2	3.9	5.1	5.7	6.2	7.1	7.2	5.7	4.4	5.0	6.5	6.1	5.9	6.2	6.1	5.8	5.0	4.6	4.2	4.9	6.1	6.7	5.7	5.5	5.3	4.7	4.2	4.1	4.6	5.0	5.9	6.5	6.7	5.5	5.1
4.3	4.1	4.3	4.7	5.3	5.0	5.6	5.1	5.4	4.8	4.3	5.2	5.5	4.9	5.1	5.5	4.9	4.8	4.6	3.6	3.4	3.7	4.3	5.2	4.8	4.8	4.2	3.6	3.8	4.5	5.4	5.6	5.5	5.8	5.2	4.7
4.0	3.6	3.8	4.0	5.2	4.3	4.3	3.7	3.9	4.4	4.3	5.3	5.8	5.9	4.7	3.5	3.5	4.6	4.5	3.6	3.5	3.8	3.3	3.6	3.4	3.6	3.0	3.3	3.5	3.7	4.2	4.4	5.5	5.3	5.3	4.6
3.3	3.3	5.0	6.4	6.4	6.4	6.1	6.0	5.4	4.5	5.2	6.3	6.0	4.9	4.4	4.5	4.0	3.7	3.3	2.7	2.8	2.4	1.8	2.0	2.5	2.3	2.0	2.0	1.9	1.7	1.7	1.7	2.2	3.0	4.1	3.5
5.0	5.2	6.0	6.3	6.4	6.5	6.4	5.3	3.8	3.6	3.4	3.2	3.2	3.0	2.8	2.6	2.0	1.9	2.0	1.8	1.7	1.7	1.6	1.7	1.7	1.8	1.8	1.8	1.8	1.7	1.6	1.8	2.6	3.9	4.7	4.9

ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
SEPTEMBER 1999 : HIRS11 Channel (500–700 hPa)
NOAA–15, USING ALL OBSERVATIONS

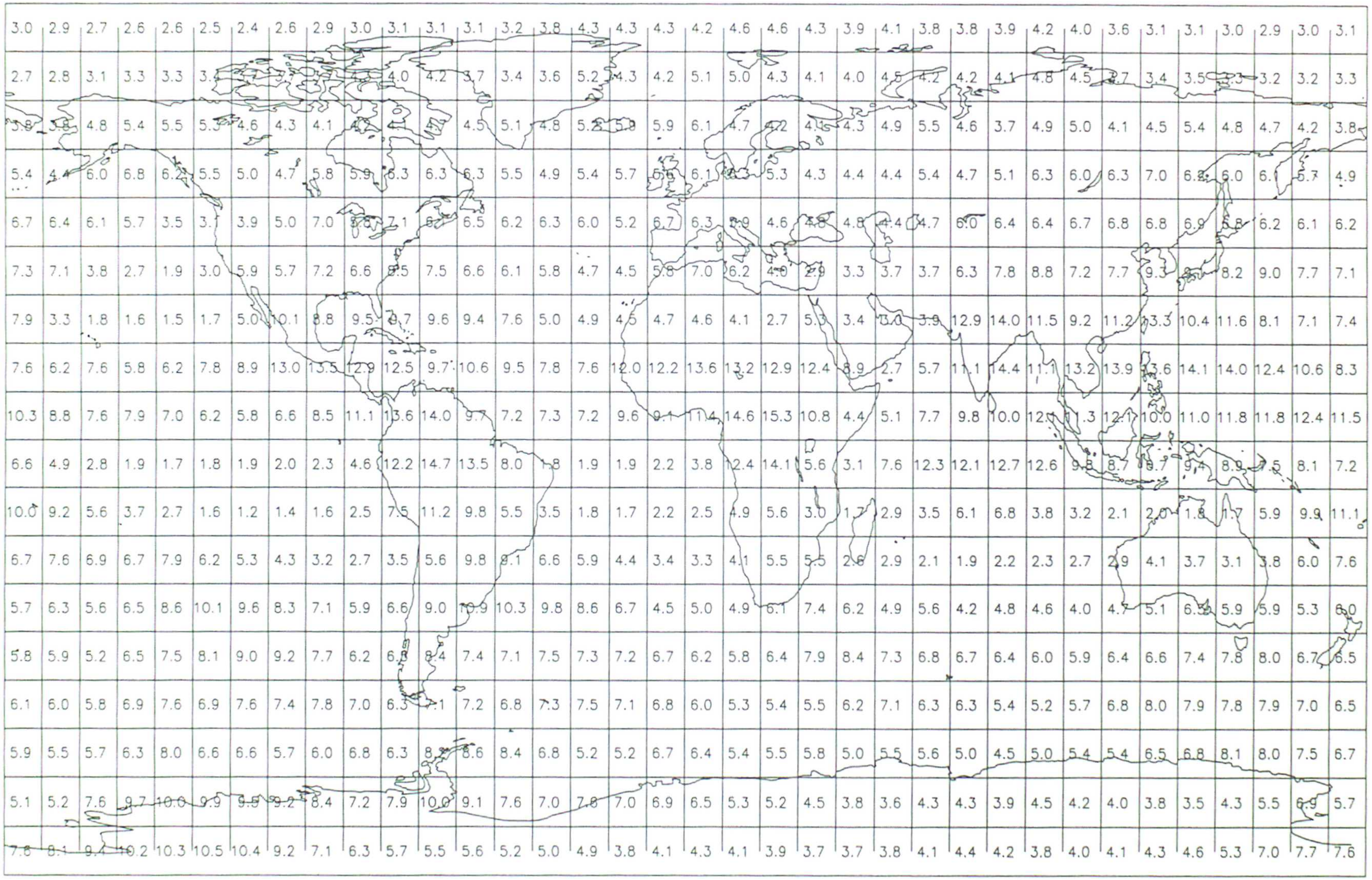
FIGURE 30



-1.8	-1.6	-1.7	-1.8	-1.5	-1.3	-1.1	-1.6	-1.9	-1.6	-1.1	-1.8	-2.0	-2.2	-2.2	-2.6	-2.8	-2.6	-2.2	-2.3	-2.2	-1.8	-1.5	-1.5	-1.2	-1.2	-1.5	-1.5	-1.7	-1.6	-1.6	-1.7	-1.8	-2.0	-1.9	-2.0
-1.1	-1.3	-1.7	-1.5	-1.5	-1.4	-2.0	-2.3	-2.8	-2.7	-2.3	-2.3	-2.2	-1.5	-2.1	-3.3	-2.5	-2.1	-2.9	-3.0	-1.8	-1.0	-1.2	-2.0	-1.7	-1.9	-2.0	-2.8	-2.9	-2.0	-1.7	-1.9	-1.7	-1.7	-1.7	-1.6
-1.7	-2.2	-2.9	-3.3	-3.2	-2.8	-2.3	-2.3	-2.4	-1.2	-2.0	-2.0	-1.7	-2.2	-2.5	-2.2	-3.3	-3.1	-3.1	-1.7	-2.0	-.6	-.9	-1.9	-2.6	-2.1	-1.4	-2.8	-2.9	-1.8	-2.0	-2.8	-3.0	-2.6	-1.9	-1.6
-2.3	-1.8	-3.0	-3.7	-2.9	-2.9	-2.2	-1.7	-2.4	-2.5	-3.2	-3.7	-2.9	-1.6	-1.3	-1.5	-1.9	-2.1	-2.8	-2.6	-1.1	-.4	-.4	-1.0	-2.0	-1.9	-2.0	-3.1	-2.8	-3.4	-3.6	-3.0	-2.5	-2.7	-2.0	-1.7
-2.0	-2.8	-2.1	-1.0	1.0	.7	-1.3	-1.5	-2.2	-2.3	-3.9	-2.8	-.9	-.7	-1.1	-1.1	-.5	-2.1	-2.6	-2.1	-.4	.2	.2	.6	.4	-.7	-1.4	-1.1	-1.7	-1.8	-1.6	-2.1	-2.1	-1.9	-1.2	-2.2
-2.3	-1.4	1.2	1.8	2.3	2.1	.2	-1.4	-2.3	-2.8	-3.4	-1.6	-1.1	-.4	-.1	.4	.6	-.6	-1.4	-1.0	.8	2.8	2.8	.4	.8	-.2	-.7	-2.0	-1.5	-.9	-2.4	-2.3	-2.7	-2.4	-1.4	-1.7
-1.3	1.5	2.3	2.5	2.4	2.5	1.2	-3.1	-1.9	-2.7	-3.1	-3.1	-2.9	-.9	.9	1.1	.0	-2.6	-2.2	-.3	1.0	-.3	-.5	1.3	1.5	-5.7	-8.9	-6.3	-1.7	-3.5	-6.6	-4.5	-5.3	-1.7	-.5	-.7
-.2	.3	-.2	1.4	1.0	.0	-2.0	-7.9	-12.2	-7.9	-7.0	-3.1	-3.9	-1.7	-.1	-1.1	-6.6	-6.6	-7.0	-6.7	-6.4	-6.6	-1.6	1.7	.1	-7.8	-9.2	-7.9	-10.0	-11.5	-12.2	-12.2	-11.7	-7.0	-3.0	-1.3
-2 2	-.9	-.3	-.6	-.2	-.4	-.1	-.5	-2.3	-6.9	-12.0	-9.1	-2.1	-.1	-.6	-.8	-2.9	-1.3	-6.0	-11.5	-11.1	-3.0	2.0	.9	-2.4	-5.1	-5.9	-10.9	-7.3	-8.7	-4.7	-6.0	-6.7	-5.3	-4.5	-4.0
1.0	1.8	2.7	2.8	2.6	2.5	2.7	2.4	2.0	-1.6	-10.5	-13.4	-8.2	-.8	2.2	2.3	2.8	2.3	.5	-6.4	-7.3	.0	2.6	-1.2	-9.2	-9.1	-10.0	-8.4	-2.9	-1.1	-.4	-3.2	-2.9	-1.2	-.7	.5
-2.3	-1.5	1.0	1.8	1.7	2.2	2.4	2.3	2.2	2.8	-1.8	-5.8	-4.4	-1.4	.7	2.3	2.3	1.9	1.4	.2	-.2	1.7	2.4	2.2	1.6	.2	-1.0	1.1	1.5	2.0	1.6	1.9	2.0	.6	-2.7	-3.6
-1.2	-2.0	-1.2	-.9	-2.6	-.6	.4	1.0	1.3	1.8	1.5	1.1	-1.1	-1.7	-.6	.0	.9	2.2	2.3	1.2	-.7	.2	2.1	2.2	2.4	2.3	2.0	1.8	1.7	1.5	.3	.2	.3	.7	-.1	-2.0
-.6	-1.5	-.5	-1.0	-2.8	-4.9	-3.3	-2.5	-1.0	-.4	-1.3	-2.6	-4.1	-4.9	-5.0	-3.4	-1.7	.2	-.2	.0	-1.3	-1.1	-.2	.2	.2	.6	.2	.1	.3	.2	-.4	-1.3	-1.4	-.3	-.6	.6
-1.3	-1.4	-1.4	-1.9	-2.9	-3.3	-3.9	-4.1	-3.0	-1.3	-2.7	-3.7	-3.4	-3.3	-3.5	-3.8	-3.6	-3.6	-3.1	-2.1	-2.7	-4.0	-4.5	-3.3	-3.2	-3.3	-3.0	-2.7	-2.5	-2.5	-2.2	-2.4	-2.4	-2.5	-2.4	-1.8
-2.6	-3.4	-3.4	-3.8	-4.6	-3.6	-2.7	-2.4	-2.5	-2.6	-2.4	-3.1	-3.7	-3.8	-4.4	-5.3	-5.3	-4.7	-4.4	-4.1	-3.8	-3.7	-4.3	-5.2	-4.7	-4.8	-5.1	-4.7	-4.1	-4.4	-5.6	-5.2	-4.8	-4.1	-3.5	-2.8
-3.9	-4.4	-4.7	-4.2	-5.1	-4.8	-3.9	-3.0	-2.8	-3.3	-3.5	-5.2	-6.1	-5.5	-4.7	-3.4	-3.6	-4.5	-5.3	-4.3	-5.1	-5.0	-3.1	-2.9	-2.8	-3.7	-2.9	-3.1	-3.3	-3.2	-3.8	-3.1	-5.0	-5.5	-6.1	-5.0
-3.6	-3.4	-5.3	-7.0	-7.0	-8.9	-7.4	-7.4	-4.7	-3.5	-4.7	-6.8	-8.0	-5.7	-4.1	-3.1	-2.6	-1.7	-1.7	-1.2	-.5	1.3	2.2	2.5	2.7	2.4	3.3	4.3	3.0	3.8	4.1	3.3	2.2	.3	-2.6	-4.1
-4.1	-4.2	-5.0	-4.9	-5.2	-5.4	-4.7	-2.6	-.6	-1.5	-2.6	-3.2	-2.9	-1.8	-.7	-.1	.6	1.3	1.5	2.2	2.1	2.1	3.5	4.8	5.4	5.5	3.9	3.1	2.7	2.8	2.7	2.8	1.6	.2	-3.4	-4.4

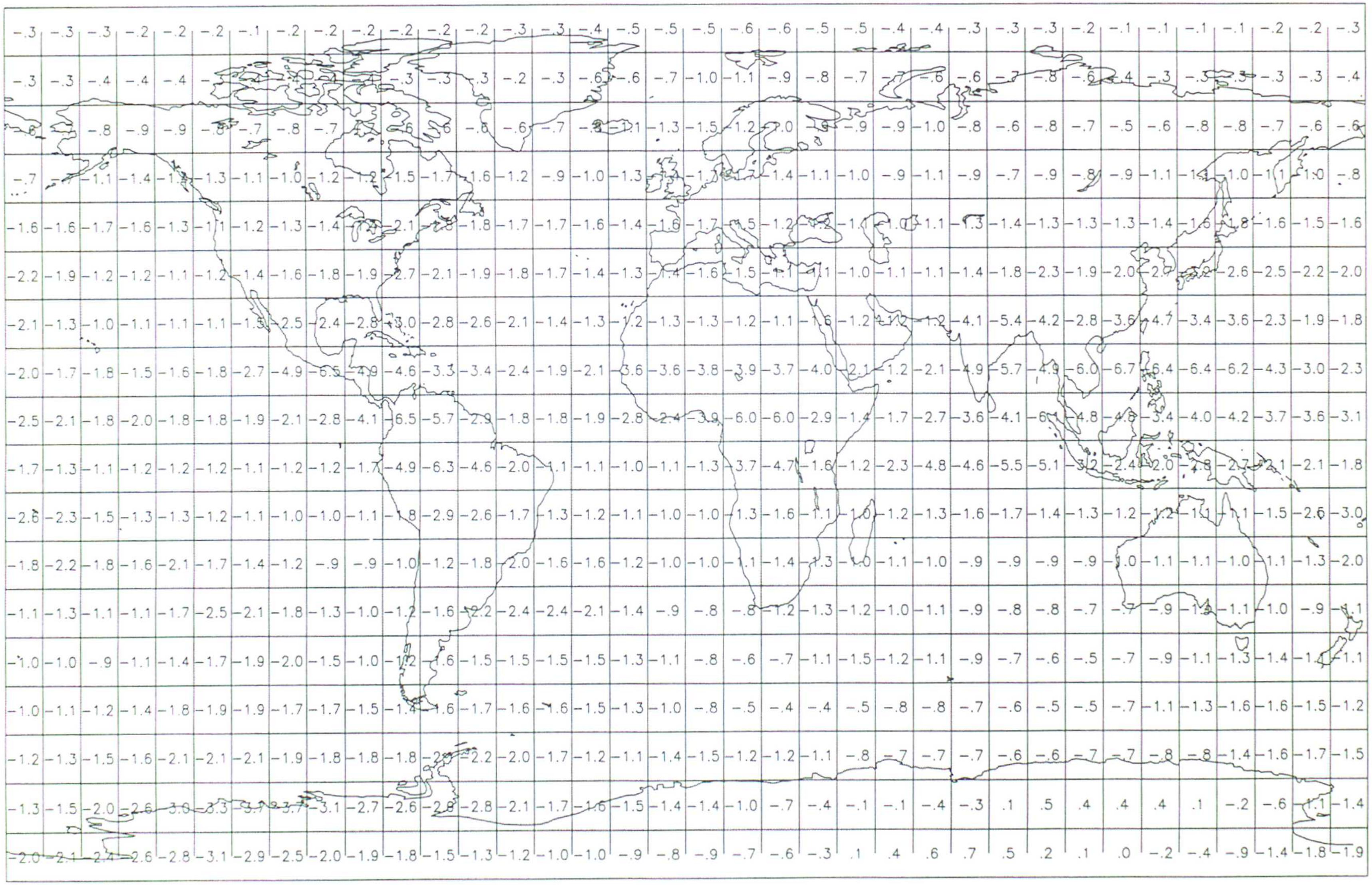
ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
SEPTEMBER 1999 : HIRS11 channel (500-700 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 31



3.0	2.9	2.7	2.6	2.6	2.5	2.4	2.6	2.9	3.0	3.1	3.1	3.1	3.2	3.8	4.3	4.3	4.3	4.2	4.6	4.6	4.3	3.9	4.1	3.8	3.8	3.9	4.2	4.0	3.6	3.1	3.1	3.0	2.9	3.0	3.1
2.7	2.8	3.1	3.3	3.3	3.4	3.7	3.7	3.7	4.3	4.0	4.2	3.7	3.4	3.6	5.2	4.3	4.2	5.1	5.0	4.3	4.1	4.0	4.5	4.2	4.2	4.1	4.8	4.5	3.7	3.4	3.5	3.3	3.2	3.2	3.3
3.8	3.8	4.8	5.4	5.5	5.3	4.6	4.3	4.1	4.2	4.1	4.7	4.5	5.1	4.8	5.2	5.0	5.9	6.1	4.7	4.2	4.1	4.3	4.9	5.5	4.6	3.7	4.9	5.0	4.1	4.5	5.4	4.8	4.7	4.2	3.8
5.4	4.4	6.0	6.8	6.2	5.5	5.0	4.7	5.8	5.9	6.3	6.3	6.3	5.5	4.9	5.4	5.7	5.6	6.1	4.3	5.3	4.3	4.4	4.4	5.4	4.7	5.1	6.3	6.0	6.3	7.0	6.2	6.0	6.1	5.7	4.9
6.7	6.4	6.1	5.7	3.5	3.1	3.9	5.0	7.0	3.6	7.1	6.1	6.5	6.2	6.3	6.0	5.2	6.7	6.3	3.9	4.6	4.8	4.8	4.4	4.7	6.0	6.4	6.4	6.7	6.8	6.8	6.9	5.8	6.2	6.1	6.2
7.3	7.1	3.8	2.7	1.9	3.0	5.9	5.7	7.2	6.6	8.5	7.5	6.6	6.1	5.8	4.7	4.5	5.8	7.0	6.2	4.0	2.9	3.3	3.7	3.7	6.3	7.8	8.8	7.2	7.7	9.3	[illegible]	8.2	9.0	7.7	7.1
7.9	3.3	1.8	1.6	1.5	1.7	5.0	10.1	8.8	9.5	9.7	9.6	9.4	7.6	5.0	4.9	4.5	4.7	4.6	4.1	2.7	5.3	3.4	3.0	3.9	12.9	14.0	11.5	9.2	11.2	13.3	10.4	11.6	8.1	7.1	7.4
7.6	6.2	7.6	5.8	6.2	7.8	8.9	13.0	13.5	12.9	12.5	9.7	10.6	9.5	7.8	7.6	12.0	12.2	13.6	13.2	12.9	12.4	8.9	2.7	5.7	11.1	14.4	11.1	13.2	13.9	13.6	14.1	14.0	12.4	10.6	8.3
10.3	8.8	7.6	7.9	7.0	6.2	5.8	6.6	8.5	11.1	13.6	14.0	9.7	7.2	7.3	7.2	9.6	9.1	11.4	14.6	15.3	10.8	4.4	5.1	7.7	9.8	10.0	12.0	11.3	12.1	10.0	11.0	11.8	11.8	12.4	11.5
6.6	4.9	2.8	1.9	1.7	1.8	1.9	2.0	2.3	4.6	12.2	14.7	13.5	8.0	1.8	1.9	1.9	2.2	3.8	12.4	14.1	5.6	3.1	7.6	12.3	12.1	12.7	12.6	9.8	8.7	8.7	9.4	8.9	7.5	8.1	7.2
10.0	9.2	5.6	3.7	2.7	1.6	1.2	1.4	1.6	2.5	7.5	11.2	9.8	5.5	3.5	1.8	1.7	2.2	2.5	4.9	5.6	3.0	1.7	2.9	3.5	6.1	6.8	3.8	3.2	2.1	2.0	1.8	1.7	5.9	9.9	11.1
6.7	7.6	6.9	6.7	7.9	6.2	5.3	4.3	3.2	2.7	3.5	5.6	9.8	8.1	6.6	5.9	4.4	3.4	3.3	4.1	5.5	5.5	2.6	2.9	2.1	1.9	2.2	2.3	2.7	2.9	4.1	3.7	3.1	3.8	6.0	7.6
5.7	6.3	5.6	6.5	8.6	10.1	9.6	8.3	7.1	5.9	6.6	9.0	10.9	10.3	9.8	8.6	6.7	4.5	5.0	4.9	6.1	7.4	6.2	4.9	5.6	4.2	4.8	4.6	4.0	4.7	5.1	6.5	5.9	5.9	5.3	6.0
5.8	5.9	5.2	6.5	7.5	8.1	9.0	9.2	7.7	6.2	6.8	8.4	7.4	7.1	7.5	7.3	7.2	6.7	6.2	5.8	6.4	7.9	8.4	7.3	6.8	6.7	6.4	6.0	5.9	6.4	6.6	7.4	7.8	8.0	6.7	6.5
6.1	6.0	5.8	6.9	7.6	6.9	7.6	7.4	7.8	7.0	6.3	7.1	7.2	6.8	7.3	7.5	7.1	6.8	6.0	5.3	5.4	5.5	6.2	7.1	6.3	6.3	5.4	5.2	5.7	6.8	8.0	7.9	7.8	7.9	7.0	6.5
5.9	5.5	5.7	6.3	8.0	6.6	6.6	5.7	6.0	6.8	6.3	[illegible]	8.6	8.4	6.8	5.2	5.2	6.7	6.4	5.4	5.5	5.8	5.0	5.5	5.6	5.0	4.5	5.0	5.4	5.4	6.5	6.8	8.1	8.0	7.5	6.7
5.1	5.2	7.6	9.7	10.0	9.9	9.5	9.2	8.4	7.2	7.9	10.0	9.1	7.6	7.0	7.8	7.0	6.9	6.5	5.3	5.2	4.5	3.8	3.6	4.3	4.3	3.9	4.5	4.2	4.0	3.8	3.5	4.3	5.5	6.9	5.7
7.8	8.1	9.4	10.2	10.3	10.5	10.4	9.2	7.1	6.3	5.7	5.5	5.6	5.2	5.0	4.9	3.8	4.1	4.3	4.1	3.9	3.7	3.7	3.8	4.1	4.4	4.2	3.8	4.0	4.1	4.3	4.6	5.3	7.0	7.7	7.6

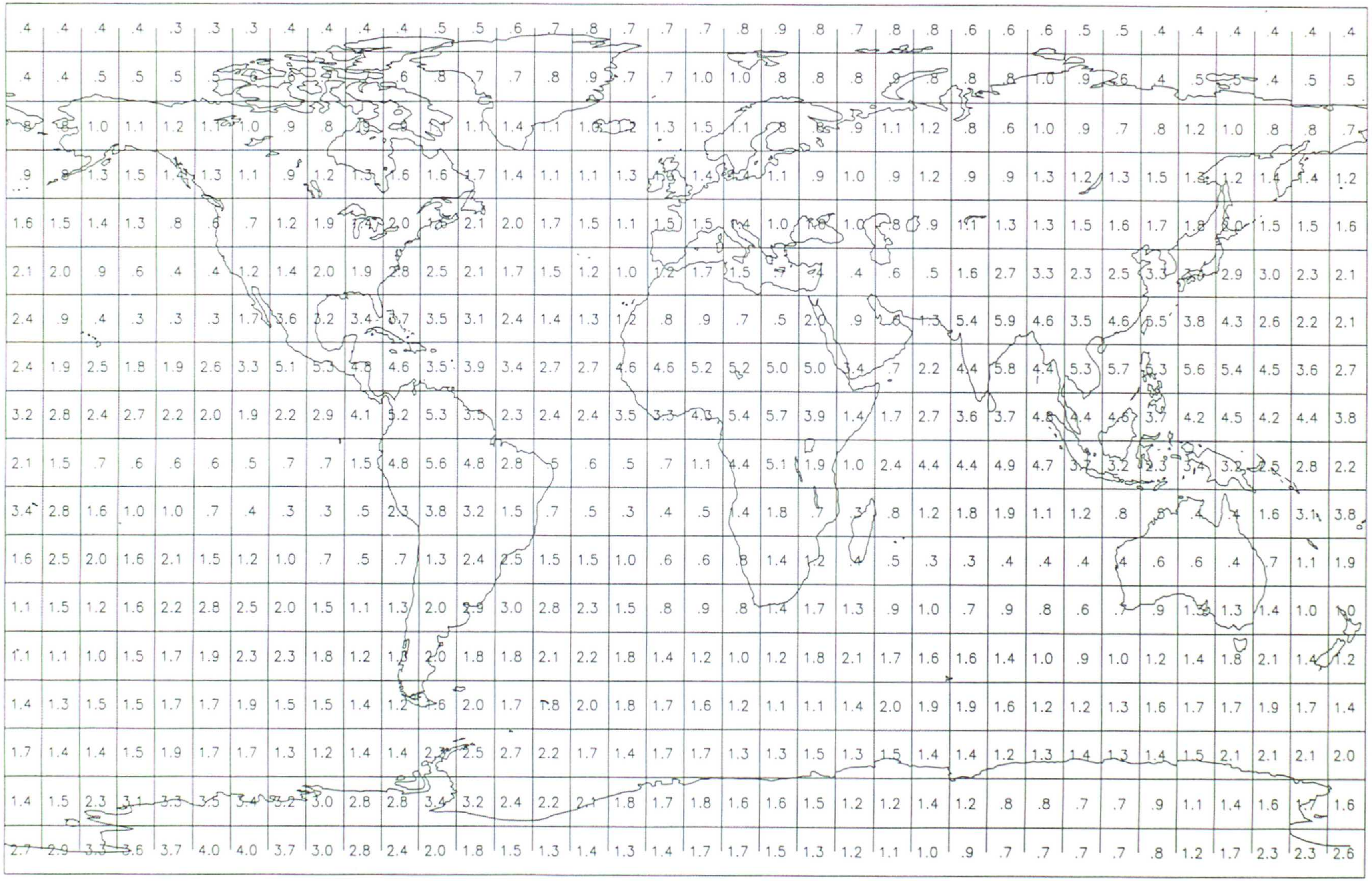
ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)　　　FIGURE 32
SEPTEMBER 1999 : HIRS4 channel (400 hPa)
NOAA–15, USING ALL OBSERVATIONS



-.3	-.3	-.3	-.2	-.2	-.2	-.1	-.2	-.2	-.2	-.2	-.2	-.2	-.3	-.3	-.4	-.5	-.5	-.5	-.6	-.6	-.5	-.5	-.4	-.4	-.3	-.3	-.3	-.2	-.1	-.1	-.1	-.1	-.2	-.2	-.3
-.3	-.3	-.4	-.4	-.4	[illegible]	-.4	-.4	-.4	-.4	-.3	-.3	-.3	-.2	-.3	-.6	-.6	-.7	-1.0	-1.1	-.9	-.8	-.7	-.7	-.6	-.6	-.7	-.8	-.6	-.4	-.3	-.3	-.3	-.3	-.3	-.4
-.6	-.7	-.8	-.9	-.9	-.8	-.7	-.8	-.7	-.7	-.6	-.6	-.6	-.6	-.7	-.8	-1.1	-1.3	-1.5	-1.2	-2.0	-.9	-.9	-.9	-1.0	-.8	-.6	-.8	-.7	-.5	-.6	-.8	-.8	-.7	-.6	-.6
-.7	-.7	-1.1	-1.4	-1.2	-1.3	-1.1	-1.0	-1.2	-1.2	-1.5	-1.7	-1.6	-1.2	-.9	-1.0	-1.3	-1.4	-1.7	-1.7	-1.4	-1.1	-1.0	-.9	-1.1	-.9	-.7	-.9	-.8	-.9	-1.1	-1.1	-1.0	-1.1	-1.0	-.8
-1.6	-1.6	-1.7	-1.6	-1.3	-1.1	-1.2	-1.3	-1.4	[illegible]	-2.1	-1.8	-1.8	-1.7	-1.7	-1.6	-1.4	-1.6	-1.7	-1.5	-1.2	-1.2	-1.1	-1.0	-1.1	-1.3	-1.4	-1.3	-1.3	-1.3	-1.4	-1.6	-1.8	-1.6	-1.5	-1.6
-2.2	-1.9	-1.2	-1.2	-1.1	-1.2	-1.4	-1.6	-1.8	-1.9	-2.7	-2.1	-1.9	-1.8	-1.7	-1.4	-1.3	-1.4	-1.6	-1.5	-1.1	-1.1	-1.0	-1.1	-1.1	-1.4	-1.8	-2.3	-1.9	-2.0	-2.7	[illegible]	-2.6	-2.5	-2.2	-2.0
-2.1	-1.3	-1.0	-1.1	-1.1	-1.1	-1.5	-2.5	-2.4	-2.8	-3.0	-2.8	-2.6	-2.1	-1.4	-1.3	-1.2	-1.3	-1.3	-1.2	-1.1	-1.6	-1.2	-1.2	-1.2	-4.1	-5.4	-4.2	-2.8	-3.6	-4.7	-3.4	-3.6	-2.3	-1.9	-1.8
-2.0	-1.7	-1.8	-1.5	-1.6	-1.8	-2.7	-4.9	-6.5	-4.9	-4.6	-3.3	-3.4	-2.4	-1.9	-2.1	-3.6	-3.6	-3.8	-3.9	-3.7	-4.0	-2.1	-1.2	-2.1	-4.9	-5.7	-4.9	-6.0	-6.7	-6.4	-6.4	-6.2	-4.3	-3.0	-2.3
-2.5	-2.1	-1.8	-2.0	-1.8	-1.8	-1.9	-2.1	-2.8	-4.1	-6.5	-5.7	-2.9	-1.8	-1.8	-1.9	-2.8	-2.4	-3.9	-6.0	-6.0	-2.9	-1.4	-1.7	-2.7	-3.6	-4.1	-6.1	-4.8	-4.8	-3.4	-4.0	-4.2	-3.7	-3.6	-3.1
-1.7	-1.3	-1.1	-1.2	-1.2	-1.2	-1.1	-1.2	-1.2	-1.7	-4.9	-6.3	-4.6	-2.0	-1.1	-1.1	-1.0	-1.1	-1.3	-3.7	-4.7	-1.6	-1.2	-2.3	-4.8	-4.6	-5.5	-5.1	-3.2	-2.4	-2.0	-2.8	-2.7	-2.1	-2.1	-1.8
-2.6	-2.3	-1.5	-1.3	-1.3	-1.2	-1.1	-1.0	-1.0	-1.1	-1.8	-2.9	-2.6	-1.7	-1.3	-1.2	-1.1	-1.0	-1.0	-1.3	-1.6	-1.1	-1.0	-1.2	-1.3	-1.6	-1.7	-1.4	-1.3	-1.2	-1.2	-1.1	-1.1	-1.5	-2.6	-3.0
-1.8	-2.2	-1.8	-1.6	-2.1	-1.7	-1.4	-1.2	-.9	-.9	-1.0	-1.2	-1.8	-2.0	-1.6	-1.6	-1.2	-1.0	-1.0	-1.1	-1.4	-1.3	-1.0	-1.1	-1.0	-.9	-.9	-.9	-.9	-1.0	-1.1	-1.1	-1.0	-1.1	-1.3	-2.0
-1.1	-1.3	-1.1	-1.1	-1.7	-2.5	-2.1	-1.8	-1.3	-1.0	-1.2	-1.6	-2.2	-2.4	-2.4	-2.1	-1.4	-.9	-.8	-.8	-1.2	-1.3	-1.2	-1.0	-1.1	-.9	-.8	-.8	-.7	-.7	-.9	-1.3	-1.1	-1.0	-.9	-1.1
-1.0	-1.0	-.9	-1.1	-1.4	-1.7	-1.9	-2.0	-1.5	-1.0	-1.2	-1.6	-1.5	-1.5	-1.5	-1.5	-1.3	-1.1	-.8	-.6	-.7	-1.1	-1.5	-1.2	-1.1	-.9	-.7	-.6	-.5	-.7	-.9	-1.1	-1.3	-1.4	-1.4	-1.1
-1.0	-1.1	-1.2	-1.4	-1.8	-1.9	-1.9	-1.7	-1.7	-1.5	-1.4	-1.6	-1.7	-1.6	-1.6	-1.5	-1.3	-1.0	-.8	-.5	-.4	-.4	-.5	-.8	-.8	-.7	-.6	-.5	-.5	-.7	-1.1	-1.3	-1.6	-1.6	-1.5	-1.2
-1.2	-1.3	-1.5	-1.6	-2.1	-2.1	-2.1	-1.9	-1.8	-1.8	-1.8	[illegible]	-2.2	-2.0	-1.7	-1.2	-1.1	-1.4	-1.5	-1.2	-1.2	-1.1	-.8	-.7	-.7	-.7	-.6	-.6	-.7	-.7	-.8	-.8	-1.4	-1.6	-1.7	-1.5
-1.3	-1.5	-2.0	-2.6	-3.0	-3.3	-3.7	-3.7	-3.1	-2.7	-2.6	-2.8	-2.8	-2.1	-1.7	-1.6	-1.5	-1.4	-1.4	-1.0	-.7	-.4	-.1	-.1	-.4	-.3	.1	.5	.4	.4	.4	.1	-.2	-.6	-1.1	-1.4
-2.0	-2.1	-2.4	-2.6	-2.8	-3.1	-2.9	-2.5	-2.0	-1.9	-1.8	-1.5	-1.3	-1.2	-1.0	-1.0	-.9	-.8	-.9	-.7	-.6	-.3	.1	.4	.6	.7	.5	.2	.1	.0	-.2	-.4	-.9	-1.4	-1.8	-1.9

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
SEPTEMBER 1999 : HIRS4 channel (400 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 33

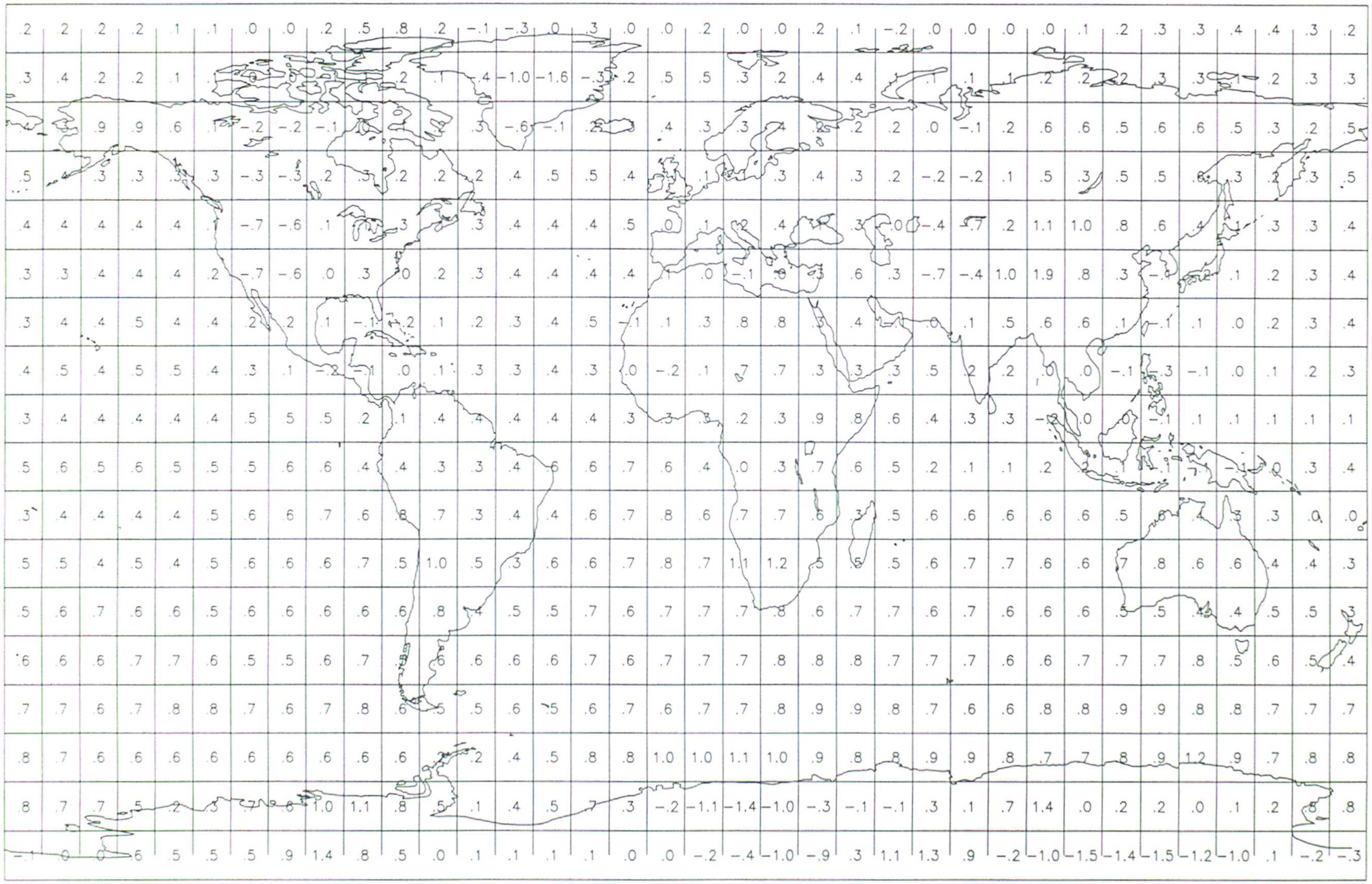

.4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .5 .5 .6 .7 .8 .7 .7 .7 .8 .9 .8 .7 .8 .8 .6 .6 .6 .5 .5 .4 .4 .4 .4 .4 .4
.4 .4 .5 .5 .5 .5 .6 .6 [illegible] [illegible] .6 .8 .7 .7 .8 .9 .7 .7 1.0 1.0 .8 .8 .8 .9 .8 .8 .8 1.0 .9 .6 .4 .5 .5 .4 .5 .5
.8 .8 1.0 1.1 1.2 1.1 1.0 .9 .8 .9 .8 1.1 1.1 1.4 1.1 1.0 1.2 1.3 1.5 1.1 .8 .8 .9 1.1 1.2 .8 .6 1.0 .9 .7 .8 1.2 1.0 .8 .8 .7
.9 .8 1.3 1.5 1.4 1.3 1.1 .9 1.2 1.3 1.6 1.6 1.7 1.4 1.1 1.1 1.3 [illegible] 1.4 [illegible] 1.1 .9 1.0 .9 1.2 .9 .9 1.3 1.2 1.3 1.5 1.3 1.2 1.4 1.4 1.2
1.6 1.5 1.4 1.3 .8 .6 .7 1.2 1.9 1.4 2.0 [illegible] 2.1 2.0 1.7 1.5 1.1 1.5 1.5 1.4 1.0 1.0 1.0 .8 .9 1.1 1.3 1.3 1.5 1.6 1.7 1.8 2.0 1.5 1.5 1.6
2.1 2.0 .9 .6 .4 .4 1.2 1.4 2.0 1.9 2.8 2.5 2.1 1.7 1.5 1.2 1.0 1.2 1.7 1.5 .7 .4 .4 .6 .5 1.6 2.7 3.3 2.3 2.5 3.3 [illegible] 2.9 3.0 2.3 2.1
2.4 .9 .4 .3 .3 .3 1.7 3.6 3.2 3.4 3.7 3.5 3.1 2.4 1.4 1.3 1.2 .8 .9 .7 .5 2.0 .9 .6 1.3 5.4 5.9 4.6 3.5 4.6 5.5 3.8 4.3 2.6 2.2 2.1
2.4 1.9 2.5 1.8 1.9 2.6 3.3 5.1 5.3 4.8 4.6 3.5 3.9 3.4 2.7 2.7 4.6 4.6 5.2 5.2 5.0 5.0 3.4 .7 2.2 4.4 5.8 4.4 5.3 5.7 5.3 5.6 5.4 4.5 3.6 2.7
3.2 2.8 2.4 2.7 2.2 2.0 1.9 2.2 2.9 4.1 5.2 5.3 3.5 2.3 2.4 2.4 3.5 3.3 4.3 5.4 5.7 3.9 1.4 1.7 2.7 3.6 3.7 4.8 4.4 4.6 3.7 4.2 4.5 4.2 4.4 3.8
2.1 1.5 .7 .6 .6 .6 .5 .7 .7 1.5 4.8 5.6 4.8 2.8 .5 .6 .5 .7 1.1 4.4 5.1 1.9 1.0 2.4 4.4 4.4 4.9 4.7 3.7 3.2 2.3 3.4 3.2 2.5 2.8 2.2
3.4 2.8 1.6 1.0 1.0 .7 .4 .3 .3 .5 2.3 3.8 3.2 1.5 .7 .5 .3 .4 .5 1.4 1.8 .7 .3 .8 1.2 1.8 1.9 1.1 1.2 .8 .8 .4 .4 1.6 3.1 3.8
1.6 2.5 2.0 1.6 2.1 1.5 1.2 1.0 .7 .5 .7 1.3 2.4 2.5 1.5 1.5 1.0 .6 .6 .8 1.4 1.2 .4 .5 .3 .3 .4 .4 .4 .4 .6 .6 .4 .7 1.1 1.9
1.1 1.5 1.2 1.6 2.2 2.8 2.5 2.0 1.5 1.1 1.3 2.0 2.9 3.0 2.8 2.3 1.5 .8 .9 .8 1.4 1.7 1.3 .9 1.0 .7 .9 .8 .6 .7 .9 1.3 1.3 1.4 1.0 1.0
1.1 1.1 1.0 1.5 1.7 1.9 2.3 2.3 1.8 1.2 1.3 2.0 1.8 1.8 2.1 2.2 1.8 1.4 1.2 1.0 1.2 1.8 2.1 1.7 1.6 1.6 1.4 1.0 .9 1.0 1.2 1.4 1.8 2.1 1.4 1.2
1.4 1.3 1.5 1.5 1.7 1.7 1.9 1.5 1.5 1.4 1.2 1.6 2.0 1.7 1.8 2.0 1.8 1.7 1.6 1.2 1.1 1.1 1.4 2.0 1.9 1.9 1.6 1.2 1.2 1.3 1.6 1.7 1.7 1.9 1.7 1.4
1.7 1.4 1.4 1.5 1.9 1.7 1.7 1.3 1.2 1.4 1.4 2.3 2.5 2.7 2.2 1.7 1.4 1.7 1.7 1.3 1.3 1.5 1.3 1.5 1.4 1.4 1.2 1.3 1.4 1.3 1.4 1.5 2.1 2.1 2.1 2.0
1.4 1.5 2.3 3.1 3.3 3.5 3.4 3.2 3.0 2.8 2.8 3.4 3.2 2.4 2.2 2.1 1.8 1.7 1.8 1.6 1.6 1.5 1.2 1.2 1.4 1.2 .8 .8 .7 .7 .9 1.1 1.4 1.6 1.7 1.6
2.7 2.9 3.3 3.6 3.7 4.0 4.0 3.7 3.0 2.8 2.4 2.0 1.8 1.5 1.3 1.4 1.3 1.4 1.7 1.7 1.5 1.3 1.2 1.1 1.0 .9 .7 .7 .7 .7 .8 1.2 1.7 2.3 2.3 2.6

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)

SEPTEMBER 1999 : AMSUA-5 Channel (700 hPa)

NOAA-15, USING ALL OBSERVATIONS

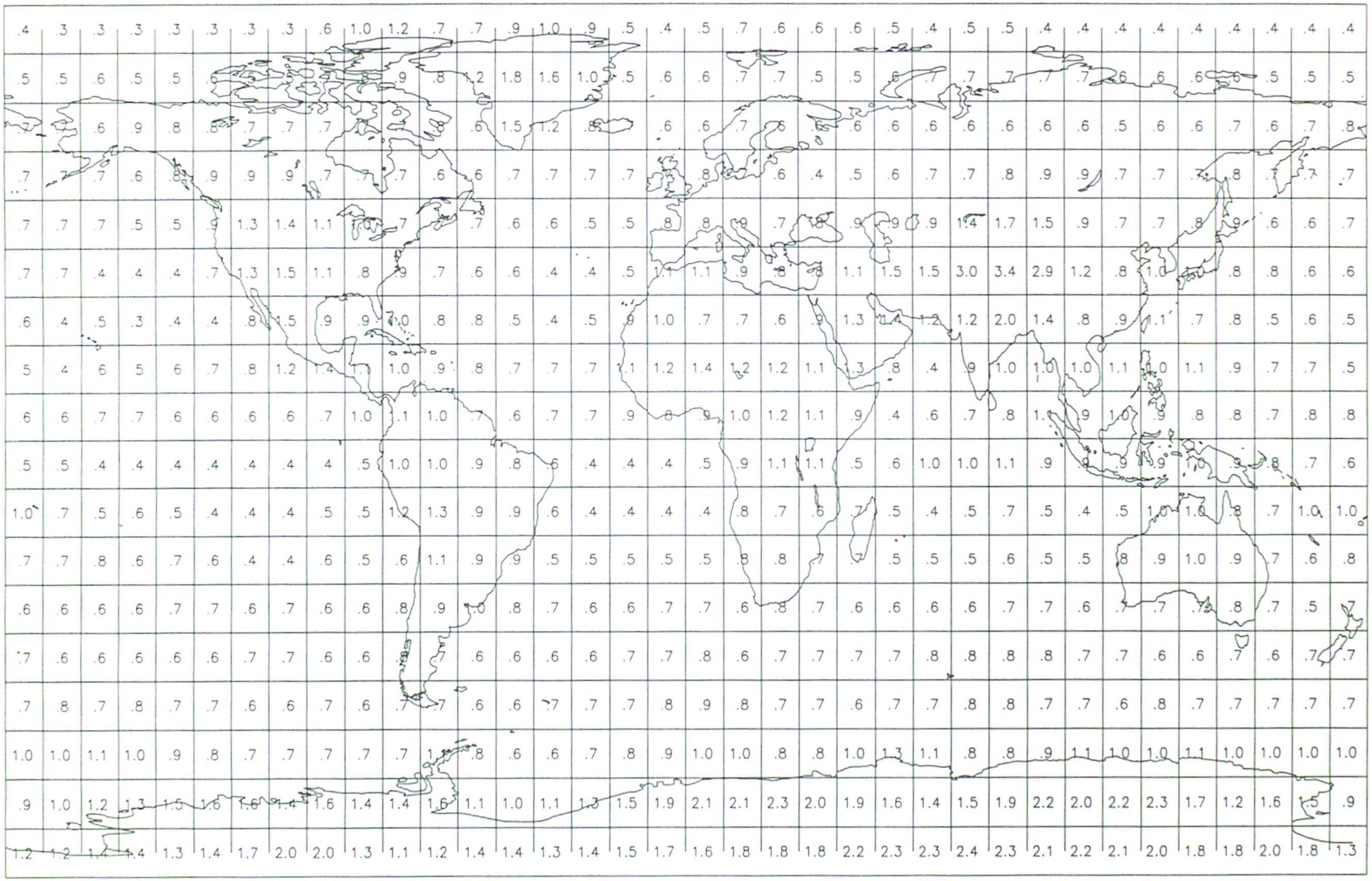
FIGURE 34



.2	.2	.2	.2	.1	.1	.0	.0	.2	.5	.8	.2	−.1	−.3	.0	.3	.0	.0	.2	.0	.0	.2	.1	−.2	.0	.0	.0	.0	.1	.2	.3	.3	.4	.4	.3	.2
.3	.4	.2	.2	.1	[illegible]	.0	.0	[illegible]	[illegible]	.2	.1	.4	−1.0	−1.6	−.3	.2	.5	.5	.3	.2	.4	.4	.1	.1	.1	.1	.2	.2	.2	.3	.3	.1	.2	.3	.3
.4	.3	.9	.9	.6	.1	−.2	−.2	−.1	[illegible]	.1	.2	.3	−.6	−.1	.2	.3	.4	.3	.3	.4	.2	.2	.2	.0	−.1	.2	.6	.6	.5	.6	.6	.5	.3	.2	.5
.5	.4	.3	.3	.3	.3	−.3	−.3	.2	.3	.2	.2	.2	.4	.5	.5	.4	[illegible]	.1	.1	.3	.4	.3	.2	−.2	−.2	.1	.5	.3	.5	.5	.6	.3	.2	.3	.5
.4	.4	.4	.4	.4	.1	−.7	−.6	.1	[illegible]	.3	[illegible]	.3	.4	.4	.4	.5	.0	.1	.2	.4	[illegible]	.3	.0	−.4	−.7	.2	1.1	1.0	.8	.6	.4	.1	.3	.3	.4
.3	.3	.4	.4	.4	.2	−.7	−.6	.0	.3	.0	.2	.3	.4	.4	.4	.4	.1	.0	−.1	.0	.3	.6	.3	−.7	−.4	1.0	1.9	.8	.3	−.1	.2	.1	.2	.3	.4
.3	.4	.4	.5	.4	.4	.2	.2	.1	−.1	.2	.1	.2	.3	.4	.5	−.1	.1	.3	.8	.8	.3	.4	[illegible]	.0	.1	.5	.6	.6	.1	−.1	.1	.0	.2	.3	.4
.4	.5	.4	.5	.5	.4	.3	.1	−.2	−.1	.0	.1	.3	.3	.4	.3	.0	−.2	.1	.7	.7	.3	.3	.3	.5	.2	.2	.0	.0	−.1	−.3	−.1	.0	.1	.2	.3
.3	.4	.4	.4	.4	.4	.5	.5	.5	.2	.1	.4	.4	.4	.4	.4	.3	.3	.3	.2	.3	.9	.8	.6	.4	.3	.3	−.2	.0	.0	−.1	.1	.1	.1	.1	.1
.5	.6	.5	.6	.5	.5	.5	.6	.6	.4	.4	.3	.3	.4	.6	.6	.7	.6	.4	.0	.3	.7	.6	.5	.2	.1	.1	.2	.2	.1	.1	.1	−.1	.0	.3	.4
.3	.4	.4	.4	.4	.5	.6	.6	.7	.6	.8	.7	.3	.4	.4	.6	.7	.8	.6	.7	.7	.6	.3	.5	.6	.6	.6	.6	.6	.5	.6	.4	.3	.3	.0	.0
.5	.5	.4	.5	.4	.5	.6	.6	.6	.7	.5	1.0	.5	.3	.6	.6	.7	.8	.7	1.1	1.2	.5	.5	.5	.6	.7	.7	.6	.6	.7	.8	.6	.6	.4	.4	.3
.5	.6	.7	.6	.6	.5	.6	.6	.6	.6	.6	.8	.4	.5	.5	.7	.6	.7	.7	.7	.8	.6	.7	.7	.6	.7	.6	.6	.6	.5	.5	.4	.4	.5	.5	.3
.6	.6	.6	.7	.7	.6	.5	.5	.6	.7	.5	.6	.6	.6	.6	.7	.6	.7	.7	.7	.8	.8	.8	.7	.7	.7	.6	.6	.7	.7	.7	.8	.5	.6	.5	.4
.7	.7	.6	.7	.8	.8	.7	.6	.7	.8	.6	.5	.5	.6	.5	.6	.7	.6	.7	.7	.8	.9	.9	.8	.7	.6	.6	.8	.8	.9	.9	.8	.8	.7	.7	.7
.8	.7	.6	.6	.6	.6	.6	.6	.6	.6	.6	[illegible]	.2	.4	.5	.8	.8	1.0	1.0	1.1	1.0	.9	.8	.8	.9	.9	.8	.7	.7	.8	.9	1.2	.9	.7	.8	.8
.8	.7	.7	.5	.2	.3	.7	.6	1.0	1.1	.8	.5	.1	.4	.5	.7	.3	−.2	−1.1	−1.4	−1.0	−.3	−.1	−.1	.3	.1	.7	1.4	.0	.2	.2	.0	.1	.2	.8	.8
−.1	.0	.0	.6	.5	.5	.5	.9	1.4	.8	.5	.0	.1	.1	.1	.1	.0	.0	−.2	−.4	−1.0	−.9	.3	1.1	1.3	.9	−.2	−1.0	−1.5	−1.4	−1.5	−1.2	−1.0	.1	−.2	−.3

ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
SEPTEMBER 1999 : AMSUA–5 channel (700 hPa)
NOAA–15, USING ALL OBSERVATIONS

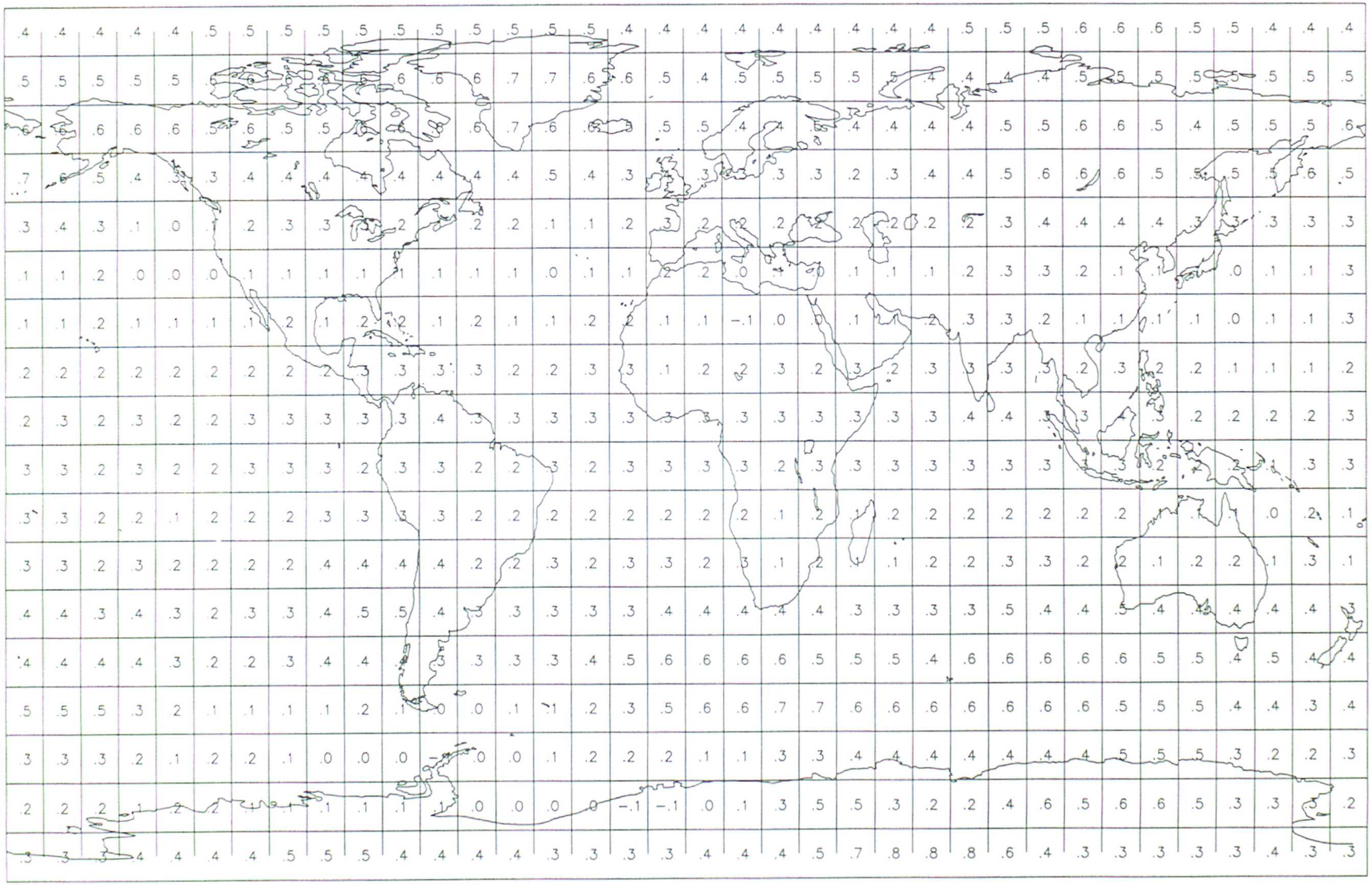
FIGURE 35



.4	.3	.3	.3	.3	.3	.3	.3	.6	1.0	1.2	.7	.7	.9	1.0	.9	.5	.4	.5	.7	.6	.6	.6	.5	.4	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4
.5	.5	.6	.5	.5	.6	.5	.5	[illegible]	.8	.9	.8	1.2	1.8	1.6	1.0	.5	.6	.6	.7	.7	.5	.5	.6	.7	.7	.7	.7	.7	.6	.6	.6	.6	.5	.5	.5
.7	.7	.6	.9	.8	.8	.7	.7	.7	.7	.7	.8	.6	1.5	1.2	.8	[illegible]	.6	.6	.7	.6	.6	.6	.6	.6	.6	.6	.6	.6	.5	.6	.6	.7	.6	.7	.8
.7	.7	.7	.6	.8	.9	.9	.9	.7	.7	.7	.6	.6	.7	.7	.7	.7	[illegible]	.8	[illegible]	.6	.4	.5	.6	.7	.7	.8	.9	.9	.7	.7	.7	.8	.7	.7	.7
.7	.7	.7	.5	.5	.9	1.3	1.4	1.1	1.0	.7	[illegible]	.7	.6	.6	.5	.5	.8	.8	.9	.7	.8	.9	.9	.9	1.4	1.7	1.5	.9	.7	.7	.8	.9	.6	.6	.7
.7	.7	.4	.4	.4	.7	1.3	1.5	1.1	.8	.9	.7	.6	.6	.4	.4	.5	1.1	1.1	.9	.8	.8	1.1	1.5	1.5	3.0	3.4	2.9	1.2	.8	1.0	[illegible]	.8	.8	.6	.6
.6	.4	.5	.3	.4	.4	.8	1.5	.9	.9	1.0	.8	.8	.5	.4	.5	.9	1.0	.7	.7	.6	.9	1.3	1.4	1.2	1.2	2.0	1.4	.8	.9	1.1	.7	.8	.5	.6	.5
.5	.4	6	5	6	.7	.8	1.2	1.4	1.1	1.0	.9	.8	.7	.7	.7	1.1	1.2	1.4	1.2	1.2	1.1	1.3	.8	.4	.9	1.0	1.0	1.0	1.1	1.0	1.1	.9	.7	.7	.5
.6	.6	.7	.7	.6	.6	.6	.6	.7	1.0	1.1	1.0	.7	.6	.7	.7	.9	.8	.9	1.0	1.2	1.1	.9	.4	.6	.7	.8	1.1	.9	1.0	.9	.8	.8	.7	.8	.8
.5	.5	.4	.4	.4	.4	.4	.4	.4	.5	1.0	1.0	.9	.8	.6	.4	.4	.4	.5	.9	1.1	1.1	.5	.6	1.0	1.0	1.1	.9	.9	.9	.9	1.0	.9	.8	.7	.6
1.0	.7	.5	.6	.5	.4	.4	.4	.5	.5	1.2	1.3	.9	.9	.6	.4	.4	.4	.4	.8	.7	.6	.7	.5	.4	.5	.7	.5	.4	.5	1.0	1.0	.8	.7	1.0	1.0
.7	.7	.8	.6	.7	.6	.4	.4	.6	.5	.6	1.1	.9	.9	.5	.5	.5	.5	.5	.8	.8	.7	.7	.5	.5	.5	.6	.5	.5	.8	.9	1.0	.9	.7	.6	.8
.6	.6	.6	.6	.7	.7	.6	.7	.6	.6	.8	.9	1.0	.8	.7	.6	.6	.7	.7	.6	.8	.7	.6	.6	.6	.6	.7	.7	.6	.7	.7	.7	.8	.7	.5	.7
.7	.6	.6	.6	.6	.6	.7	.7	.6	.6	.8	.7	.6	.6	.6	.6	.7	.7	.8	.6	.7	.7	.7	.7	.8	.8	.8	.8	.7	.7	.6	.6	.7	.6	.7	.7
.7	.8	.7	.8	.7	.7	.6	.6	.7	.6	.7	.7	.6	.6	.7	.7	.7	.8	.9	.8	.7	.7	.6	.7	.7	.8	.8	.7	.7	.6	.8	.7	.7	.7	.7	.7
1.0	1.0	1.1	1.0	.9	.8	.7	.7	.7	.7	.7	[illegible]	.8	.6	.6	.7	.8	.9	1.0	1.0	.8	.8	1.0	1.3	1.1	.8	.8	.9	1.1	1.0	1.0	1.1	1.0	1.0	1.0	1.0
.9	1.0	1.2	1.3	1.5	1.6	1.6	1.4	1.6	1.4	1.4	1.6	1.1	1.0	1.1	1.3	1.5	1.9	2.1	2.1	2.3	2.0	1.9	1.6	1.4	1.5	1.9	2.2	2.0	2.2	2.3	1.7	1.2	1.6	1.5	.9
1.2	1.2	1.4	1.4	1.3	1.4	1.7	2.0	2.0	1.3	1.1	1.2	1.4	1.4	1.3	1.4	1.5	1.7	1.6	1.8	1.8	1.8	2.2	2.3	2.3	2.4	2.3	2.1	2.2	2.1	2.0	1.8	1.8	2.0	1.8	1.3

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
SEPTEMBER 1999 : AMSUA-7 Channel (300 hPa)
NOAA-15, USING ALL OBSERVATIONS

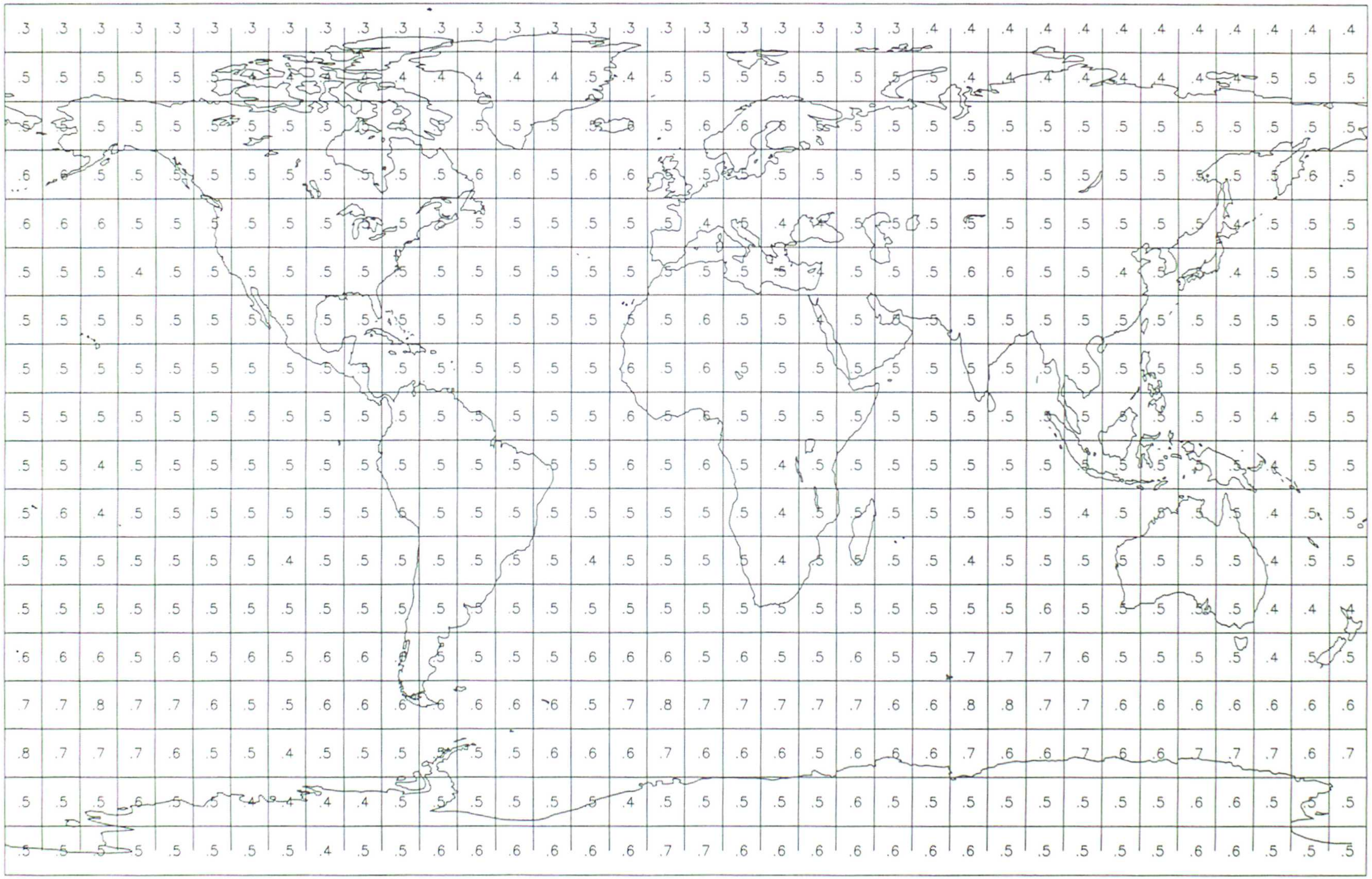
FIGURE 36



.4	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.6	.6	.6	.5	.5	.4	.4	.4
.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.6	.6	.6	.7	.7	.6	.6	.5	.4	.5	.5	.5	.5	.5	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5
.6	.6	.6	.6	.6	.5	.6	.5	.5	.6	.6	.8	.6	.7	.6	.6	.5	.5	.5	.4	.4	.5	.4	.4	.4	.4	.5	.5	.6	.6	.5	.4	.5	.5	.5	.6
.7	.6	.5	.4	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.3	.4	.3	.3	.3	.3	.2	.3	.4	.4	.5	.6	.6	.6	.5	.5	.5	.5	.6	.5
.3	.4	.3	.1	.0	.1	.2	.3	.3	.3	.2		.2	.2	.1	.1	.2	.3	.2	.2	.2	.2	.2	.2	.2	.2	.2	.3	.4	.4	.4	.4	.3	.3	.3	.3	.3
.1	.1	.2	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1	.1	.0	.1	.1	.2	.2	.0	.1	.0	.1	.1	.1	.2	.3	.3	.2	.1	.1		.0	.1	.1	.3
.1	.1	.2	.1	.1	.1	.1	.2	.1	.2	.2	.1	.2	.1	.1	.2	.2	.1	.1	−.1	.0	.0	.1	.1	.2	.3	.3	.2	.1	.1	.1	.1	.0	.1	.1	.3
.2	.2	.2	.2	.2	.2	.2	.2	.2	.3	.3	.3	.3	.2	.2	.3	.3	.1	.2	.2	.3	.2	.3	.2	.3	.3	.3	.3	.2	.3	.2	.2	.1	.1	.1	.2
.2	.3	.2	.3	.2	.2	.3	.3	.3	.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.3	.3	.4	.3	.2	.2	.2	.2	.3
.3	.3	.2	.3	.2	.2	.3	.3	.3	.2	.3	.3	.2	.2	.3	.2	.3	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.2	.2	.1	.3	.3
.3	.3	.2	.2	.1	.2	.2	.2	.3	.3	.3	.3	.2	.2	.2	.2	.2	.2	.2	.2	.1	.2	.1	.2	.2	.2	.2	.2	.2	.2	.1	.1	.1	.0	.2	.1
.3	.3	.2	.3	.2	.2	.2	.2	.4	.4	.4	.4	.2	.2	.3	.2	.3	.3	.2	.3	.1	.2	.1	.1	.2	.2	.3	.3	.2	.2	.1	.2	.2	.1	.3	.1
.4	.4	.3	.4	.3	.2	.3	.3	.4	.5	.5	.4	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.3	.3	.3	.3	.5	.4	.4	.5	.4	.4	.4	.4	.4	.3
.4	.4	.4	.4	.3	.2	.2	.3	.4	.4	.4	.3	.3	.3	.3	.4	.5	.6	.6	.6	.6	.5	.5	.5	.4	.6	.6	.6	.6	.6	.5	.5	.4	.5	.4	.4
.5	.5	.5	.3	.2	.1	.1	.1	.1	.2	.1	.0	.0	.1	.1	.2	.3	.5	.6	.6	.7	.7	.6	.6	.6	.6	.6	.6	.6	.5	.5	.5	.4	.4	.3	.4
.3	.3	.3	.2	.1	.2	.2	.1	.0	.0	.0	−.1	.0	.0	.1	.2	.2	.2	.1	.1	.3	.3	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.3	.2	.2	.3
.2	.2	.2	.1	.2	.2	.1	.1	.1	.1	.1	.1	.0	.0	.0	.0	−.1	−.1	.0	.1	.3	.5	.5	.3	.2	.2	.4	.6	.5	.6	.6	.5	.3	.3	.3	.2
.3	.3	.3	.4	.4	.4	.4	.5	.5	.5	.4	.4	.4	.4	.3	.3	.3	.3	.4	.4	.4	.5	.7	.8	.8	.8	.6	.4	.3	.3	.3	.3	.3	.4	.3	.3

ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
SEPTEMBER 1999 : AMSUA–7 channel (300 hPa)
NOAA–15, USING ALL OBSERVATIONS

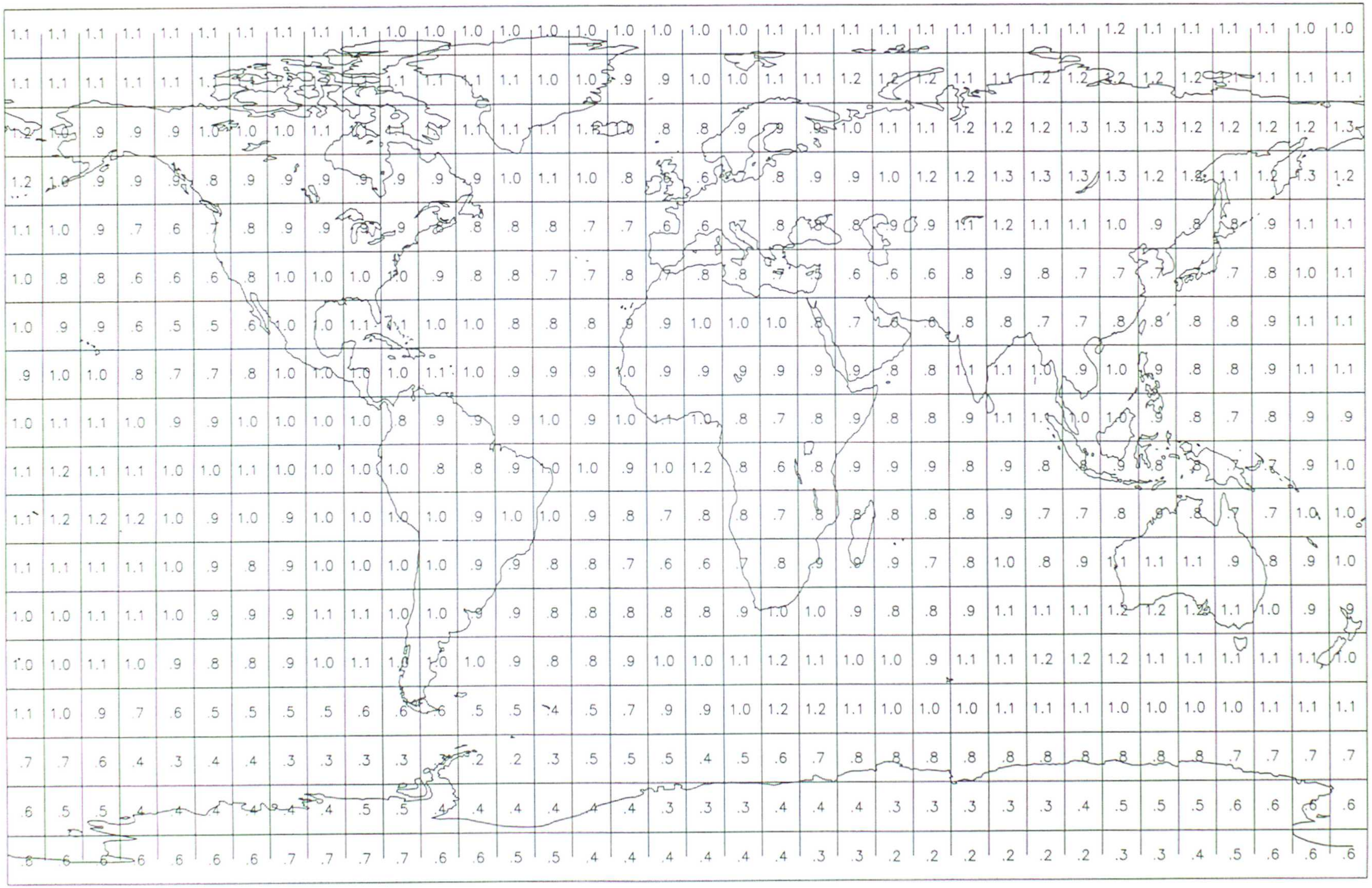
FIGURE 37



.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.5	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.6	.6	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
.6	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.5	.6	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5
.6	.6	.6	.5	.5	.5	.5	.5	.5		.5		.5	.5	.5	.5	.5	.5	.4	.5	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5
.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.6	.6	.5	.5	.4	.5		.4	.5	.5	.5
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5
.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.6	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5
.5	.6	.4	.5	.5	.5	.5	.5	.5	.5	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.4	.5	.5
.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.4	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.5	.5	.5	.5	.4	.4	.4
.6	.6	.6	.5	.6	.5	.6	.5	.6	.6	.6	.5	.5	.5	.5	.6	.6	.6	.5	.6	.5	.5	.6	.5	.5	.7	.7	.7	.6	.5	.5	.5	.5	.4	.5	.5
.7	.7	.8	.7	.7	.6	.5	.5	.6	.6	.6	.6	.6	.6	.6	.5	.7	.8	.7	.7	.7	.7	.7	.6	.6	.8	.8	.7	.7	.6	.6	.6	.6	.6	.6	.6
.8	.7	.7	.7	.6	.5	.5	.4	.5	.5	.5	.5	.5	.5	.6	.6	.6	.7	.6	.6	.6	.5	.6	.6	.6	.7	.6	.6	.7	.6	.6	.7	.7	.7	.6	.7
.5	.5	.5	.6	.5	.5	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.6	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.5	.5	.5
.5	.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.6	.6	.6	.6	.6	.6	.7	.7	.6	.6	.6	.6	.6	.6	.6	.5	.5	.5	.5	.5	.6	.6	.5	.5	.5

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
SEPTEMBER 1999 : AMSUA-9 Channel (100 hPa)
NOAA-15, USING ALL OBSERVATIONS

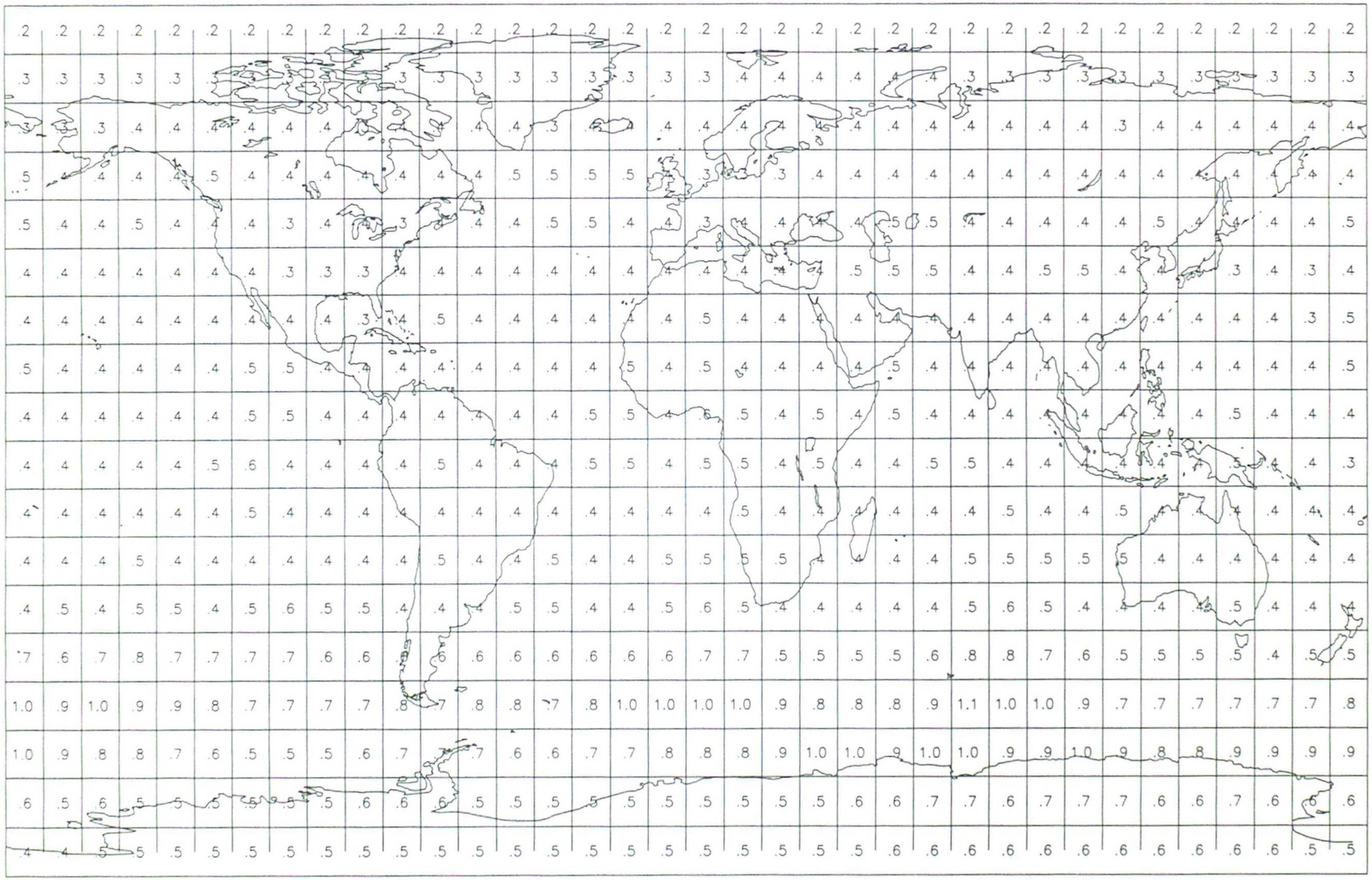
FIGURE 38



1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.1	1.1	1.1	1.1	1.0	1.0
1.1	1.1	1.1	1.1	1.1	1.1	[illegible]	[illegible]	[illegible]	[illegible]	1.1	1.1	1.1	1.1	1.0	1.0	.9	.9	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1
1.2	1.0	.9	.9	.9	1.0	1.0	1.0	1.1	[illegible]	1.1	1.1	1.1	1.1	1.1	[illegible]	1.0	.8	.8	.9	.9	.9	1.0	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.3
1.2	1.0	.9	.9	.9	.8	.9	.9	.9	.9	.9	.9	.9	1.0	1.1	1.0	.8	.6	.6		.8	.9	.9	1.0	1.2	1.2	1.3	1.3	1.3	1.3	1.2	1.2	1.1	1.2	1.3	1.2
1.1	1.0	.9	.7	.6	.7	.8	.9	.9	.9	.9	.8	.8	.8	.8	.7	.7	.6	.6	.7	.8	.8	.8	.9	.9	1.1	1.2	1.1	1.1	1.0	.9	.8	.8	.9	1.1	1.1
1.0	.8	.8	.6	.6	.6	.8	1.0	1.0	1.0	1.0	.9	.8	.8	.7	.7	.8	.7	.8	.8	.7	.5	.6	.6	.6	.8	.9	.8	.7	.7	.7		.7	.8	1.0	1.1
1.0	.9	.9	.6	.5	.5	.6	1.0	1.0	1.1	1.1	1.0	1.0	.8	.8	.8	.9	.9	1.0	1.0	1.0	.8	.7	.6	.6	.8	.8	.7	.7	.8	.8	.8	.8	.9	1.1	1.1
.9	1.0	1.0	.8	.7	.7	.8	1.0	1.0	1.0	1.0	1.1	1.0	.9	.9	.9	1.0	.9	.9	.9	.9	.9	.9	.8	.8	1.1	1.1	1.0	.9	1.0	.9	.8	.8	.9	1.1	1.1
1.0	1.1	1.1	1.0	.9	.9	1.0	1.0	1.0	1.0	.8	.9	.9	.9	1.0	.9	1.0	1.1	1.0	.8	.7	.8	.9	.8	.8	.9	1.1	1.1	1.0	1.0	.9	.8	.7	.8	.9	.9
1.1	1.2	1.1	1.1	1.0	1.0	1.1	1.0	1.0	1.0	1.0	.8	.8	.9	1.0	1.0	.9	1.0	1.2	.8	.6	.8	.9	.9	.9	.8	.9	.8	.8	.9	.8	.8	.7	.7	.9	1.0
1.1	1.2	1.2	1.2	1.0	.9	1.0	.9	1.0	1.0	1.0	1.0	.9	1.0	1.0	.9	.8	.7	.8	.8	.7	.8	.8	.8	.8	.8	.9	.7	.7	.8	.9	.8	.7	.7	1.0	1.0
1.1	1.1	1.1	1.1	1.0	.9	.8	.9	1.0	1.0	1.0	1.0	.9	.9	.8	.8	.7	.6	.6	.7	.8	.9	.9	.9	.7	.8	1.0	.8	.9	1.1	1.1	1.1	.9	.8	.9	1.0
1.0	1.0	1.1	1.1	1.0	.9	.9	.9	1.1	1.1	1.0	1.0	.9	.9	.8	.8	.8	.8	.8	.9	1.0	1.0	.9	.8	.8	.9	1.1	1.1	1.1	1.2	1.2	1.2	1.1	1.0	.9	.9
1.0	1.0	1.1	1.0	.9	.8	.8	.9	1.0	1.1	1.0	1.0	1.0	.9	.8	.8	.9	1.0	1.0	1.1	1.2	1.1	1.0	1.0	.9	1.1	1.1	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.0
1.1	1.0	.9	.7	.6	.5	.5	.5	.5	.6	.6	.6	.5	.5	.4	.5	.7	.9	.9	1.0	1.2	1.2	1.1	1.0	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.1	1.1	1.1
.7	.7	.6	.4	.3	.4	.4	.3	.3	.3	.3	.3	.2	.2	.3	.5	.5	.5	.4	.5	.6	.7	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.7	.7	.7	.7
.6	.5	.5	.4	.4	.4	.4	.4	.4	.5	.5	.4	.4	.4	.4	.4	.4	.3	.3	.3	.4	.4	.4	.3	.3	.3	.3	.3	.4	.5	.5	.5	.6	.6	.6	.6
.6	.6	.6	.6	.6	.6	.6	.7	.7	.7	.7	.6	.6	.5	.5	.4	.4	.4	.4	.4	.4	.3	.3	.2	.2	.2	.2	.2	.2	.3	.3	.4	.5	.6	.6	.6

ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
SEPTEMBER 1999 : AMSUA–9 channel (100 hPa)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 39



.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
.3	.3	.3	.3	.3	.3	.3	.3	[illegible]	[illegible]	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3
.3	.3	.3	.4	.4	.4	.4	.4	.4	[illegible]	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4
.5	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5	[illegible]	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.5	.4	.4	.5	.4	.4	.4	.3	.4	.4	.3	.4	.4	.4	.5	.5	.4	.4	.3	.4	.4	.4	.4	.5	.5	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.5
.4	.4	.4	.4	.4	.4	.4	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.4	.4	.5	.5	.4	.4	.4	.3	.4	.3	.4
.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.5	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.5
.5	.4	.4	.4	.4	.4	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.5	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5
.4	.4	.4	.4	.4	.4	.5	.5	.4	.4	.4	.4	.4	.4	.4	.5	.5	.4	.6	.5	.4	.5	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4
.4	.4	.4	.4	.4	.5	.6	.4	.4	.4	.4	.5	.4	.4	.4	.5	.5	.4	.5	.5	.4	.5	.4	.4	.5	.5	.4	.4	.4	.4	.4	.4	.5	.4	.4	.3
.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.5	.4	.4	.5	.4	.4	.4	.4	.4	.4
.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.5	.4	.4	.5	.5	.5	.5	.4	.4	.4	.4	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4
.4	.5	.4	.5	.5	.4	.5	.6	.5	.5	.4	.4	.4	.5	.5	.4	.4	.5	.6	.5	.4	.4	.4	.4	.4	.5	.6	.5	.4	.4	.4	.4	.5	.4	.4	.4
.7	.6	.7	.8	.7	.7	.7	.7	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.7	.7	.5	.5	.5	.5	.6	.8	.8	.7	.6	.5	.5	.5	.5	.4	.5	.5
1.0	.9	1.0	.9	.9	.8	.7	.7	.7	.7	.8	.7	.8	.8	.7	.8	1.0	1.0	1.0	1.0	.9	.8	.8	.8	.9	1.1	1.0	1.0	.9	.7	.7	.7	.7	.7	.7	.8
1.0	.9	.8	.8	.7	.6	.5	.5	.5	.6	.7	.7	.7	.6	.6	.7	.7	.8	.8	.8	.9	1.0	1.0	.9	1.0	1.0	.9	.9	1.0	.9	.8	.8	.9	.9	.9	.9
.6	.5	.6	.5	.5	.5	.5	.5	.5	.6	.6	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.7	.7	.6	.7	.7	.7	.6	.6	.7	.6	.6	.6
.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.5	.5

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13504	26.2	-20.0	ALL	P	SUR	227	0	0	0.6	-0.2	0.6
13505	19.2	-23.9	ALL	P	SUR	174	0	0	0.7	0.2	0.7
13506	15.4	-17.8	ALL	P	SUR	199	0	0	0.9	-0.1	0.9
41503	21.1	-50.8	ALL	P	SUR	39	0	0	0.9	0.0	0.9
41505	37.5	-57.8	ALL	P	SUR	294	2	1	1.3	0.0	1.3
41520	19.1	-49.9	ALL	P	SUR	250	4	2	1.4	-0.3	1.4
41521	26.3	-58.4	ALL	P	SUR	269	7	3	1.3	0.2	1.3
41524	14.7	-62.3	ALL	P	SUR	233	0	0	0.9	0.2	1.0
41525	16.1	-51.7	ALL	P	SUR	236	0	0	1.1	0.3	1.2
41528	33.8	-74.5	ALL	P	SUR	276	0	0	1.4	0.2	1.4
41599	29.4	-38.8	ALL	P	SUR	521	2	0	0.7	-0.3	0.8
41625	29.9	-73.9	ALL	P	SUR	262	0	0	1.2	0.3	1.2
41626	16.9	-55.1	ALL	P	SUR	133	0	0	0.7	0.3	0.7
41627	14.5	-55.7	ALL	P	SUR	26	0	0	0.4	-0.1	0.4
41628	25.5	-55.2	ALL	P	SUR	137	0	0	0.7	0.6	1.0
41630	20.4	-41.6	ALL	P	SUR	260	0	0	0.8	0.2	0.9
41636	26.8	-47.7	ALL	P	SUR	570	15	3	1.4	0.8	1.6
41637	27.4	-48.6	ALL	P	SUR	235	4	2	0.9	0.3	1.0
41638	24.4	-49.7	ALL	P	SUR	515	0	0	1.5	0.7	1.7
41640	14.8	-52.3	ALL	P	SUR	246	0	0	0.8	0.4	0.9
41641	13.7	-48.7	ALL	P	SUR	227	0	0	0.8	0.4	0.9
41643	22.5	-52.8	ALL	P	SUR	260	0	0	0.9	0.2	0.9
41644	18.9	-46.0	ALL	P	SUR	250	0	0	1.0	0.0	1.0
41645	23.7	-47.7	ALL	P	SUR	260	0	0	0.7	-0.2	0.8
41648	43.9	-42.9	ALL	P	SUR	291	0	0	1.1	0.2	1.1
41649	27.4	-69.2	ALL	P	SUR	249	0	0	0.7	0.4	0.8
41650	26.7	-73.2	ALL	P	SUR	265	1	0	0.9	0.1	0.9
41651	24.6	-72.9	ALL	P	SUR	273	2	1	1.7	0.3	1.8
41652	22.4	-68.2	ALL	P	SUR	260	0	0	0.9	-0.3	1.0
41653	22.1	-67.6	ALL	P	SUR	260	0	0	1.0	0.0	1.0
41654	17.1	-59.2	ALL	P	SUR	196	0	0	0.9	0.7	1.1
41656	27.3	-69.1	ALL	P	SUR	101	0	0	0.8	0.6	1.0
41657	27.3	-70.8	ALL	P	SUR	260	0	0	0.8	0.5	1.0
41660	21.8	-71.7	ALL	P	SUR	174	22	13	4.5	0.1	4.5
41852	35.3	-71.6	ALL	P	SUR	263	71	27	4.7	-0.4	4.7
41853	28.9	-74.2	ALL	P	SUR	493	3	1	1.3	1.3	1.8
425992	11.9	-74.5	ALL	P	SUR	1	0	0	0.0	-0.7	0.7
44546	42.9	-34.4	ALL	P	SUR	1657	2	0	1.1	0.1	1.1
44607	53.2	-39.2	ALL	P	SUR	598	1	0	1.8	0.1	1.8
44608	44.2	-21.9	ALL	P	SUR	1549	0	0	1.1	0.0	1.1
44610	55.7	-36.7	ALL	P	SUR	1630	4	0	1.5	0.0	1.5
44613	31.5	-21.5	ALL	P	SUR	878	7	1	0.8	0.1	0.8
44614	50.3	-39.6	ALL	P	SUR	655	0	0	1.7	-0.7	1.8
44616	58.9	-18.5	ALL	P	SUR	1447	4	0	1.6	-0.5	1.7
44621	50.3	-25.4	ALL	P	SUR	699	12	2	1.6	-0.7	1.7
44624	58.0	-16.7	ALL	P	SUR	1402	6	0	1.6	-0.7	1.7
44625	51.3	-26.4	ALL	P	SUR	1410	5	0	1.5	-0.3	1.5
44626	47.8	-41.0	ALL	P	SUR	952	3	0	1.3	-0.2	1.3
44627	42.8	-52.7	ALL	P	SUR	884	0	0	1.2	-0.1	1.2
44628	40.0	-42.5	ALL	P	SUR	853	4	0	1.4	0.1	1.4
44629	42.4	-40.2	ALL	P	SUR	18	2	11	1.0	13.8	13.8
44630	47.0	-41.3	ALL	P	SUR	936	2	0	1.2	-0.3	1.3
44728	53.1	-12.1	ALL	P	SUR	818	11	1	1.3	-0.4	1.4
44742	43.6	-6.2	ALL	P	SUR	272	1	0	0.7	0.2	0.7
44764	51.4	-0.8	ALL	P	SUR	15	0	0	0.6	-8.3	8.3
44765	30.8	-49.8	ALL	P	SUR	370	7	2	1.3	0.0	1.3
44766	55.1	-34.9	ALL	P	SUR	896	6	1	1.4	-0.7	1.6
44773	61.7	-24.8	ALL	P	SUR	1477	4	0	1.3	-0.7	1.5
44777	62.1	-48.9	ALL	P	SUR	1451	5	0	1.1	-0.3	1.1

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
44778	48.0	-6.8	ALL	P	SUR	797	1	0	0.8	-0.2	0.8
44807	43.5	-70.1	ALL	P	SUR	1	1	100			
45505	41.7	-82.4	ALL	P	SUR	1	0	0	0.0	-1.1	1.1
45805	41.7	-82.4	ALL	P	SUR	1	0	0	0.0	-2.7	2.7
45808	44.3	-82.4	ALL	P	SUR	1	0	0	0.0	-0.1	0.1
61533	47.9	-3.0	ALL	P	SUR	55	55	100			
61553	38.3	-77.0	ALL	P	SUR	7	7	100			
62506	41.3	-20.4	ALL	P	SUR	594	0	0	1.8	1.4	2.3
62520	31.9	-24.7	ALL	P	SUR	786	1	0	0.8	-0.2	0.8
62554	34.3	-15.0	ALL	P	SUR	817	3	0	0.6	0.3	0.7
62703	49.5	-2.9	ALL	P	SUR	1	0	0	0.0	1.2	1.2
62710	54.8	-4.8	ALL	P	SUR	1	0	0	0.0	0.4	0.4
62753	47.5	-8.5	ALL	P	SUR	1	0	0	0.0	-0.2	0.2
62881	51.0	-13.3	ALL	P	SUR	1	0	0	0.0	2.1	2.1
62901	49.5	-5.8	ALL	P	SUR	169	0	0	0.8	0.3	0.8
64513	38.3	-77.0	ALL	P	SUR	2	2	100			
64516	60.9	-44.1	ALL	P	SUR	1630	3	0	1.3	-0.5	1.4
64517	61.8	-57.7	ALL	P	SUR	1479	0	0	1.2	-0.2	1.2
64518	56.8	-42.9	ALL	P	SUR	1462	0	0	1.3	-0.7	1.5
64529	62.8	-2.9	ALL	P	SUR	897	8	1	1.3	-0.8	1.5
64530	61.4	-33.7	ALL	P	SUR	921	8	1	1.4	-0.7	1.6
64546	61.4	-29.1	ALL	P	SUR	566	0	0	1.3	-0.7	1.4
64693	66.9	-19.1	ALL	P	SUR	710	0	0	1.4	-0.5	1.5
64694	66.6	-17.0	ALL	P	SUR	659	1	0	1.6	-0.9	1.8
64695	66.3	-21.8	ALL	P	SUR	720	0	0	1.5	0.4	1.6
64698	67.3	-22.9	ALL	P	SUR	1020	5	0	2.0	0.0	2.0
64699	65.2	-36.8	ALL	P	SUR	953	7	1	2.5	-0.1	2.5
64700	65.4	-27.1	ALL	P	SUR	895	33	4	3.2	1.4	3.5
65593	62.6	-16.6	ALL	P	SUR	766	0	0	1.6	-0.8	1.8
65594	63.6	-33.6	ALL	P	SUR	919	4	0	1.5	-0.9	1.8
65595	58.5	-33.2	ALL	P	SUR	1088	8	1	1.3	-0.7	1.5
65596	58.7	-38.4	ALL	P	SUR	537	0	0	1.2	-0.5	1.4
65599	62.9	-30.8	ALL	P	SUR	1521	4	0	1.3	-0.3	1.3
WIND SPEED											
41503	21.1	-50.8	ALL	SPEED	SUR	36	0	0	1.7	-1.1	2.0
41520	19.1	-49.9	ALL	SPEED	SUR	84	0	0	1.7	-0.5	1.7
41521	26.3	-58.4	ALL	SPEED	SUR	242	0	0	3.3	-2.0	3.8
41524	14.7	-62.3	ALL	SPEED	SUR	211	0	0	5.8	7.3	9.4
41625	29.9	-73.9	ALL	SPEED	SUR	243	0	0	1.5	-0.4	1.6
41630	20.4	-41.6	ALL	SPEED	SUR	256	0	0	2.2	-0.5	2.2
41636	26.8	-47.7	ALL	SPEED	SUR	118	0	0	2.1	-2.9	3.5
41638	24.4	-49.7	ALL	SPEED	SUR	132	0	0	1.9	-0.5	2.0
41640	14.8	-52.3	ALL	SPEED	SUR	234	0	0	2.5	0.2	2.5
41641	13.7	-48.7	ALL	SPEED	SUR	217	0	0	2.4	-0.1	2.4
41644	18.9	-46.0	ALL	SPEED	SUR	52	0	0	10.7	1.7	10.9
41649	27.4	-69.2	ALL	SPEED	SUR	241	0	0	3.8	1.9	4.3
41650	26.7	-73.2	ALL	SPEED	SUR	94	0	0	1.8	-0.2	1.8
41651	24.6	-72.9	ALL	SPEED	SUR	105	0	0	1.8	0.7	2.0
41652	22.4	-68.2	ALL	SPEED	SUR	253	0	0	3.4	0.8	3.5
41653	22.1	-67.6	ALL	SPEED	SUR	95	0	0	1.6	-0.9	1.8
425992	11.9	-74.5	ALL	SPEED	SUR	1	0	0	0.0	-0.8	0.8
44607	53.2	-39.2	ALL	SPEED	SUR	591	0	0	2.2	1.0	2.4
44773	61.7	-24.8	ALL	SPEED	SUR	1131	0	0	2.4	-0.2	2.5
44777	62.1	-48.9	ALL	SPEED	SUR	1245	0	0	1.9	-0.4	1.9
62506	41.3	-20.4	ALL	SPEED	SUR	587	0	0	2.0	0.1	2.0
62881	51.0	-13.3	ALL	SPEED	SUR	1	0	0	0.0	-2.5	2.5
65599	62.9	-30.8	ALL	SPEED	SUR	1327	0	0	2.3	0.0	2.3
41503	21.1	-50.8	ALL	DIRN.	SUR	16	0	0	25.7	-7.3	26.7
41520	19.1	-49.9	ALL	DIRN.	SUR	40	0	0	13.4	11.2	17.4

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND DIRECTION											
41521	26.3	-58.4	ALL	DIRN.	SUR	103	0	0	15.7	-8.6	18.0
41524	14.7	-62.3	ALL	DIRN.	SUR	94	0	0	26.2	-0.9	26.3
41625	29.9	-73.9	ALL	DIRN.	SUR	151	0	0	18.7	8.7	20.6
41630	20.4	-41.6	ALL	DIRN.	SUR	138	0	0	17.3	17.3	24.4
41638	24.4	-49.7	ALL	DIRN.	SUR	59	0	0	18.4	69.3	71.7
41640	14.8	-52.3	ALL	DIRN.	SUR	117	0	0	22.0	10.1	24.2
41641	13.7	-48.7	ALL	DIRN.	SUR	114	0	0	22.5	27.6	35.7
41644	18.9	-46.0	ALL	DIRN.	SUR	19	0	0	18.2	8.4	20.1
41649	27.4	-69.2	ALL	DIRN.	SUR	90	0	0	22.7	10.5	25.0
41650	26.7	-73.2	ALL	DIRN.	SUR	8	0	0	37.4	36.7	52.4
41651	24.6	-72.9	ALL	DIRN.	SUR	13	0	0	26.1	4.6	26.5
41652	22.4	-68.2	ALL	DIRN.	SUR	103	0	0	19.5	-4.6	20.0
41653	22.1	-67.6	ALL	DIRN.	SUR	15	0	0	24.3	1.4	24.3
44607	53.2	-39.2	ALL	DIRN.	SUR	528	0	0	16.3	0.0	16.3
44773	61.7	-24.8	ALL	DIRN.	SUR	825	0	0	19.0	-1.5	19.1
44777	62.1	-48.9	ALL	DIRN.	SUR	819	0	0	16.7	-4.7	17.3
62506	41.3	-20.4	ALL	DIRN.	SUR	410	0	0	19.1	-10.4	21.8
62881	51.0	-13.3	ALL	DIRN.	SUR	1	0	0	0.0	17.2	17.2
65599	62.9	-30.8	ALL	DIRN.	SUR	983	0	0	16.1	-1.0	16.1

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	3040	0	4	1.7	0.0	3007	0	6	0	9.5	1.0
ACA	1584	0	3	1.7	-0.2	1612	0	3	0	8.2	0.7
AEA	224	0	4	2.0	0.8	215	0	5	0	7.9	1.1
AEL	432	8	23	2.1	-0.2	444	0	18	0	10.0	0.8
AFL	294	1	5	2.0	0.7	295	2	6	0	7.7	1.4
AFR	1068	2	8	2.0	0.4	1071	0	8	0	8.4	0.8
AIH	292	1	3	1.6	0.0	294	0	2	0	6.1	0.5
AJM	79	0	0	1.4	-0.2	76	0	1	0	8.0	1.4
AMM	44	2	5	1.5	1.2	46	0	2	0	8.7	0.9
AMT	22	0	5	1.7	0.8	22	0	5	0	5.4	1.4
AMX	225	0	4	1.8	0.1	228	0	8	0	12.5	0.9
ANZ	188	0	4	1.9	-1.0	186	0	6	0	8.5	0.2
AOM	306	2	4	1.7	0.6	305	0	4	0	8.7	1.2
AVA	294	1	3	1.8	0.2	294	1	7	0	10.8	0.9
AZA	539	5	14	2.6	0.8	541	0	7	0	9.1	0.8
BAF	31	6	29	4.6	2.2	33	0	0	0	6.9	0.4
BAL	216	0	10	1.8	-0.6	216	0	11	0	8.2	0.7
BAW	1502	1	7	1.9	0.0	1500	0	8	0	8.0	0.9
BLX	30	0	0	2.1	-0.8	31	0	3	0	11.4	0.5
BWA	87	1	6	2.1	0.9	87	2	8	0	9.8	2.0
CDN	784	0	3	1.8	0.5	786	0	4	0	8.8	0.9
CFC	24	0	8	2.3	0.4	25	0	8	0	9.0	3.2
CFG	446	0	3	1.8	-1.0	446	1	4	0	7.2	0.6
CKS	26	0	4	2.1	-0.4	28	0	4	0	9.7	1.5
CKT	77	0	5	1.9	1.2	77	1	6	0	8.0	1.6
CLX	324	0	2	1.7	-0.4	328	0	4	0	8.8	0.1
CMM	558	0	2	1.7	0.1	557	0	2	0	6.3	0.4
COA	749	0	5	2.0	0.2	747	1	13	0	14.6	2.2
CRL	177	1	4	1.6	0.5	177	0	3	0	8.6	0.6
CTB	131	0	1	1.9	-0.3	132	0	3	0	8.1	0.1
CUB	269	0	9	2.4	0.9	269	0	10	0	11.6	0.4
DAL	1934	0	13	1.8	-0.4	1965	0	15	0	10.6	0.6
DBY	359	1	4	1.6	-0.4	361	0	5	0	9.2	0.3
DLH	2116	0	5	1.8	-0.1	2103	0	6	0	7.9	0.7
EEZ	39	18	21	1.5	0.0	39	0	5	0	8.5	1.5
EIN	40	0	8	1.7	0.3	40	0	8	0	9.3	0.9
ELY	108	1	5	1.7	0.0	111	0	7	0	9.8	1.1
ETH	46	0	9	1.5	0.4	50	2	12	0	7.9	2.3
EWW	75	4	7	1.9	0.3	75	0	5	0	9.3	2.6
FDX	563	1	7	1.7	0.4	574	1	8	0	10.6	1.0
FIN	405	0	3	1.8	0.5	394	0	4	0	8.5	0.8
GAF	76	1	7	1.8	-0.4	81	0	7	0	9.3	1.2
GCO	53	8	23	3.0	1.5	54	4	24	0	16.4	3.4
GTI	134	0	4	1.8	-0.7	134	0	7	0	11.6	0.3
HLF	55	0	5	1.2	-0.3	54	0	7	0	9.0	3.0
IBE	1170	1	12	1.8	0.4	1158	0	13	0	9.4	1.2
ICE	1199	0	3	1.7	0.2	1175	0	4	0	7.9	1.1
IWD	56	0	11	2.2	0.0	56	0	11	0	9.4	2.6
JKK	130	2	5	1.6	0.1	120	1	8	0	12.3	0.5
KLM	1589	0	7	1.8	0.4	1599	0	8	0	9.3	0.9
LDA	74	1	12	2.5	-0.4	73	0	11	0	8.8	1.8
LDI	300	5	20	3.2	0.4	304	0	9	0	9.1	0.5
LIB	83	4	8	2.0	1.1	83	0	5	0	6.3	1.1
LOT	287	2	6	2.2	-1.1	281	0	5	0	8.5	0.1
LTU	387	0	6	1.8	-0.2	387	0	4	0	7.8	1.2
MAH	29	0	0	1.6	-0.9	30	0	0	0	6.8	0.4
MAS	35	0	3	2.4	-0.5	37	0	3	0	9.2	1.3
MON	117	1	4	2.0	0.1	111	2	6	0	8.0	2.2
MPD	129	2	5	2.2	0.9	125	0	3	0	9.1	1.2

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
MPH	534	0	2	1.8	-0.4	541	0	4	0	8.2	0.4
NCA	49	0	0	1.8	0.1	47	0	2	0	12.0	0.9
NWA	3206	0	2	2.0	0.8	3089	1	4	0	9.1	0.8
OAL	20	0	0	1.6	-0.7	20	0	0	0	8.0	3.8
PAC	73	21	33	3.9	1.6	74	0	11	0	10.2	1.7
RAM	28	0	0	1.5	0.0	28	0	0	0	7.0	0.9
RCH	142	1	11	1.9	0.1	145	0	15	0	12.1	2.9
RJA	45	2	7	1.9	-0.6	45	0	9	0	10.1	1.1
ROY	238	1	6	1.7	0.0	237	0	5	0	8.5	1.0
RRR	153	0	8	2.0	-0.2	154	1	10	0	7.7	1.4
SAB	23	0	0	1.6	0.4	24	0	0	0	5.0	0.5
SAS	1464	0	10	1.8	-0.3	1453	0	11	0	8.0	0.3
SIA	110	0	4	1.7	-0.5	113	0	7	0	9.4	-0.9
SLR	106	0	55	2.1	-0.6	107	0	12	0	8.8	0.2
SVA	107	1	5	1.8	-0.1	124	0	9	0	9.3	0.1
SWR	71	0	4	1.4	0.2	71	0	7	0	9.5	1.6
TAP	429	0	6	1.4	-0.2	430	0	9	0	9.1	1.2
TOW	126	0	6	2.0	0.6	132	0	9	0	9.2	0.7
TPA	25	0	0	1.4	0.4	26	0	0	0	6.5	-0.2
TSC	207	0	4	2.0	0.5	208	0	5	0	8.5	0.5
TWA	1042	1	5	1.8	0.3	983	0	5	0	9.4	1.2
UAL	2277	0	5	1.8	0.0	2307	0	6	0	7.9	0.6
UPS	682	0	15	1.9	0.3	688	0	17	0	9.5	0.4
USA	310	1	5	1.6	0.0	269	0	4	0	8.1	1.0
VIR	410	1	3	1.7	-0.2	411	0	3	0	7.7	0.7
VKG	26	0	15	2.1	-0.1	26	0	15	0	14.2	-0.3
WOA	103	1	4	1.3	0.3	103	1	4	0	8.4	1.7
BA	2162	0	1	1.4	0.4	2161	0	1	0	6.2	0.9
EU	9325	0	7	1.6	0.1	9320	0	6	0	7.2	0.9
KL	2582	0	0	1.6	0.8	2582	0	0	0	7.0	0.9
LH	475	0	0	1.8	1.3	475	0	1	0	6.8	1.1
ADS	375	1	2	2.2	0.5	385	0	4	0	9.5	0.8
US ACARS	14637	0	4	1.6	0.6	14678	0	2	0	6.9	0.5

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
/BLK	12	Z	100	1	0	0.0	0.0	0.0
DBBH	00	Z	100	1	0	0.0	2.0	-2.0
DBLK	12	Z	100	13	0	12.3	12.7	3.2
ELML7	00	Z	100	15	0	11.9	28.2	25.5
ELML7	12	Z	100	17	0	15.9	40.2	36.9
FNOR	00	Z	100	11	0	17.2	25.6	19.0
FNOR	12	Z	100	12	0	13.3	18.3	12.6
FNOU	00	Z	100	11	0	76.3	76.4	-3.7
FNOU	12	Z	100	9	0	28.1	28.2	-1.2
FNPH	00	Z	100	15	0	9.8	11.3	5.7
FNPH	12	Z	100	11	1	9.8	9.9	1.3
FNRS	00	Z	100	12	0	16.0	16.1	1.2
FNRS	12	Z	100	11	0	40.0	40.1	-1.8
JBOA	00	Z	100	1	0	0.0	15.0	15.0
JGQH	00	Z	100	1	0	0.0	23.0	23.0
LDWR	00	Z	100	30	0	8.8	9.9	4.4
LDWR	12	Z	100	26	0	10.6	10.9	2.7
OVYA2	00	Z	100	8	0	5.3	6.7	-4.1
OVYA2	12	Z	100	11	0	21.0	24.5	12.6
OXYH2	00	Z	100	16	0	17.7	21.7	12.5
OXYH2	12	Z	100	19	0	14.8	19.9	13.3
S6LA	00	Z	100	1	0	0.0	19.0	19.0
S6LA	12	Z	100	1	0	0.0	54.0	54.0
VJJF	00	Z	100	1	0	0.0	22.0	22.0
VNAA	00	Z	100	1	0	0.0	41.0	41.0
V2XM	00	Z	100	2	0	7.5	36.3	35.5
V2XM	12	Z	100	3	0	8.5	34.1	33.0
WTEC	00	Z	100	1	0	0.0	17.0	17.0
XXBA	00	Z	100	1	0	0.0	26.0	26.0
ZCBP6	00	Z	100	3	0	19.3	21.3	9.0
ZCBP6	12	Z	100	3	0	12.7	18.9	-14.0
03953	00	Z	100	28	0	11.2	27.5	25.1
03953	12	Z	100	28	0	12.7	18.4	13.3
04018	00	Z	100	29	0	10.1	17.8	14.7
04018	12	Z	100	28	0	11.8	14.4	8.2
04220	00	Z	100	23	0	9.1	13.2	9.5
04220	12	Z	100	23	0	10.0	14.0	9.8
04270	00	Z	100	25	0	9.9	13.0	8.5
04270	12	Z	100	24	0	12.7	13.4	-4.4
04339	00	Z	100	26	0	16.3	17.2	5.5
04339	12	Z	100	26	0	11.3	12.9	6.3
04360	00	Z	100	30	0	10.1	15.0	11.1
04360	12	Z	100	29	0	7.4	7.9	2.6
08001	00	Z	100	23	1	13.3	13.6	3.0
08001	12	Z	100	22	0	13.8	14.8	-5.4
08508	00	Z	100	1	0	0.0	13.0	13.0
08508	12	Z	100	23	0	21.1	22.6	-8.2
08522	00	Z	100	1	0	0.0	16.0	16.0
08522	12	Z	100	28	0	14.3	16.3	8.0
08594	00	Z	100	19	0	16.5	30.0	25.0
08594	12	Z	100	18	0	14.0	15.5	6.6
60020	00	Z	100	1	0	0.0	35.0	35.0
60020	12	Z	100	1	0	0.0	8.0	8.0
71600	00	Z	100	29	0	8.3	13.7	-10.9
71600	12	Z	100	29	0	13.0	22.3	-18.1
72201	00	Z	100	27	0	11.5	24.2	21.4
72201	12	Z	100	27	0	12.2	40.3	38.4
72402	00	Z	100	28	0	26.5	29.7	13.4
72402	12	Z	100	29	0	22.9	36.8	28.8
74494	00	Z	100	21	0	10.4	11.1	4.0
74494	12	Z	100	29	0	10.6	11.3	-3.9
78016	00	Z	100	26	0	22.7	30.9	21.0
78016	12	Z	100	25	0	16.5	24.1	17.5

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
/BLK	12	Z	500	1	0	0.0	24.0	-24.0
DBBH	00	Z	500	1	0	0.0	3.0	3.0
DBLK	12	Z	500	15	0	12.8	13.3	3.7
ELML7	00	Z	500	21	0	8.2	9.7	5.0
ELML7	12	Z	500	20	0	22.0	22.7	5.2
FNOR	00	Z	500	13	0	10.0	11.3	5.2
FNOR	12	Z	500	12	0	6.7	8.2	4.8
FNOU	00	Z	500	11	1	8.1	11.9	8.7
FNOU	12	Z	500	11	0	12.7	12.9	2.3
FNPH	00	Z	500	16	0	10.5	10.5	0.1
FNPH	12	Z	500	11	1	6.6	6.6	0.3
FNRS	00	Z	500	13	0	5.9	6.3	2.1
FNRS	12	Z	500	12	0	25.4	27.2	-9.8
JBOA	00	Z	500	1	0	0.0	11.0	11.0
JGQH	00	Z	500	1	0	0.0	9.0	9.0
LDWR	00	Z	500	30	0	7.5	7.5	0.5
LDWR	12	Z	500	26	0	6.8	7.5	-3.9
OVYA2	00	Z	500	9	0	11.3	11.8	-3.3
OVYA2	12	Z	500	12	0	16.7	17.2	-4.0
OXYH2	00	Z	500	18	0	13.8	17.9	11.4
OXYH2	12	Z	500	19	0	10.1	13.5	8.9
SHIP	00	Z	500	1	0	0.0	3.0	3.0
SHIPDR	00	Z	500	1	0	0.0	38.0	38.0
S6LA	00	Z	500	1	0	0.0	15.0	15.0
S6LA	12	Z	500	1	0	0.0	34.0	34.0
VJJF	00	Z	500	1	0	0.0	3.0	-3.0
VNAA	00	Z	500	1	0	0.0	41.0	41.0
V2XM	00	Z	500	2	0	11.5	14.3	8.5
V2XM	12	Z	500	3	0	5.0	28.4	28.0
WTEC	00	Z	500	1	0	0.0	7.0	-7.0
XXBA	00	Z	500	1	0	0.0	19.0	19.0
ZCBP6	00	Z	500	3	0	12.0	14.4	-8.0
ZCBP6	12	Z	500	4	0	10.4	11.9	5.8
03953	00	Z	500	30	0	9.4	13.7	10.0
03953	12	Z	500	29	0	7.7	10.1	6.5
04018	00	Z	500	29	0	8.9	11.3	6.9
04018	12	Z	500	28	0	11.6	14.2	8.1
04220	00	Z	500	30	0	9.7	11.8	6.6
04220	12	Z	500	29	0	10.4	12.1	6.1
04270	00	Z	500	29	0	13.4	13.8	3.5
04270	12	Z	500	28	0	9.7	9.9	1.9
04339	00	Z	500	29	0	10.5	12.4	6.5
04339	12	Z	500	29	0	8.6	10.4	5.9
04360	00	Z	500	30	0	9.7	10.7	4.5
04360	12	Z	500	29	0	9.3	9.3	0.4
08001	00	Z	500	27	1	10.7	11.1	3.0
08001	12	Z	500	26	0	7.8	7.9	-1.3
08508	00	Z	500	1	0	0.0	4.0	-4.0
08508	12	Z	500	27	0	7.7	8.9	4.6
08522	00	Z	500	1	0	0.0	9.0	9.0
08522	12	Z	500	28	0	8.5	9.8	4.8
08594	00	Z	500	25	0	6.7	7.4	3.1
08594	12	Z	500	22	0	22.2	24.6	-9.0
60020	00	Z	500	21	0	6.3	7.7	4.3
60020	12	Z	500	18	0	12.4	13.6	5.6
71600	00	Z	500	29	0	8.7	9.8	-4.6
71600	12	Z	500	29	0	10.5	11.1	-3.7
72201	00	Z	500	29	0	9.5	18.0	15.3
72201	12	Z	500	27	0	7.1	16.3	14.6
72402	00	Z	500	29	0	14.8	14.9	1.2
72402	12	Z	500	29	0	12.9	13.1	-2.1
74494	00	Z	500	27	0	9.8	10.6	4.0
74494	12	Z	500	29	0	7.5	8.2	3.2
78016	00	Z	500	27	0	15.8	21.3	14.3
78016	12	Z	500	25	0	11.8	18.1	13.8

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in $m\ s^{-1}$
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
/BLK	12	V	100	1	0	0	0.0	-0.6	-0.4
DBBH	00	V	100	1	0	0	0.0	-1.6	-2.9
DBLK	12	V	100	11	0	0	0.0	0.5	1.4
ELML7	00	V	100	13	0	0	2.0	0.1	0.5
ELML7	12	V	100	16	0	0	4.3	2.4	1.2
FNOR	00	V	100	11	0	0	2.7	-0.9	-0.7
FNOR	12	V	100	12	0	0	4.0	0.4	2.2
FNOU	00	V	100	8	0	0	3.6	0.5	1.0
FNOU	12	V	100	9	0	0	3.6	0.0	-2.2
FNPH	00	V	100	13	0	0	3.6	-0.3	1.2
FNPH	12	V	100	12	0	0	2.5	-0.6	-0.2
FNRS	00	V	100	9	0	0	3.7	-2.0	0.8
FNRS	12	V	100	10	0	0	3.7	0.8	0.8
JBOA	00	V	100	1	0	0	4.1	2.1	1.2
JGQH	00	V	100	1	0	0	4.1	0.6	0.5
LDWR	00	V	100	30	0	0	2.8	0.3	-1.4
LDWR	12	V	100	25	0	0	2.0	-0.6	0.6
OVYA2	00	V	100	8	0	0	2.1	-0.7	-1.6
OVYA2	12	V	100	10	0	0	2.1	-0.1	-1.4
OXYH2	00	V	100	14	0	7	4.0	-1.7	1.1
OXYH2	12	V	100	18	0	11	3.2	-2.2	0.4
S6LA	00	V	100	1	0	0	3.5	2.9	-0.6
S6LA	12	V	100	1	0	0	3.5	1.9	-2.9
VJJF	00	V	100	1	0	0	3.5	0.3	-1.4
VNAA	00	V	100	1	0	0	4.5	-7.8	1.9
V2XM	00	V	100	2	0	0	4.5	-2.4	-3.1
V2XM	12	V	100	3	0	0	4.5	-1.6	-0.2
WTEC	00	V	100	1	0	0	4.5	1.5	1.6
ZCBP6	00	V	100	2	0	0	4.5	2.9	-0.5
ZCBP6	12	V	100	2	0	0	4.5	3.6	0.6
03953	00	V	100	28	0	0	3.0	0.3	0.8
03953	12	V	100	27	0	0	2.4	-0.7	0.3
04018	00	V	100	29	0	0	2.4	0.3	-0.2
04018	12	V	100	28	0	0	3.1	-0.7	-0.3
04220	00	V	100	19	0	0	1.4	0.0	0.3
04220	12	V	100	17	0	0	2.3	0.3	-0.1
04270	00	V	100	23	0	0	3.0	0.0	0.1
04270	12	V	100	22	0	0	3.0	-0.5	-0.3
04339	00	V	100	25	0	8	2.2	-0.7	0.7
04339	12	V	100	25	0	0	5.8	-1.0	0.4
04360	00	V	100	29	0	0	3.1	0.4	0.4
04360	12	V	100	28	0	0	2.6	-0.2	-0.2
08001	00	V	100	23	0	0	7.7	1.2	1.0
08001	12	V	100	4	0	0	3.1	-2.5	-0.2
08508	00	V	100	1	0	0	4.2	5.4	-3.1
08508	12	V	100	19	0	0	4.2	0.4	1.5
08594	00	V	100	19	0	63	2.8	0.9	-1.0
08594	12	V	100	21	0	61	3.3	1.2	-0.8
60020	12	V	100	1	0	0	6.5	-0.8	-1.9
71600	00	V	100	29	0	0	3.8	0.6	0.1
71600	12	V	100	29	0	0	3.0	0.1	-0.1
72201	00	V	100	27	0	44	3.4	0.7	0.0
72201	12	V	100	27	0	48	2.7	1.0	-0.4
72402	00	V	100	26	0	0	1.8	-0.6	0.4
72402	12	V	100	29	0	0	2.9	-0.1	0.3
74494	00	V	100	20	0	0	2.6	-1.3	1.3
74494	12	V	100	29	0	0	3.0	-0.4	0.0
78016	00	V	100	26	0	0	4.8	0.3	-0.3
78016	12	V	100	25	0	0	2.8	-1.7	-0.3

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: September 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
/BLK	12	V	500	1	0	0	0.0	4.8	-1.5
DBBH	00	V	500	1	0	0	0.0	1.6	-1.0
DBLK	12	V	500	11	0	0	0.0	0.3	1.3
ELML7	00	V	500	18	0	0	3.2	0.5	-0.4
ELML7	12	V	500	18	0	0	1.8	0.6	0.0
FNOR	00	V	500	12	0	0	3.8	0.2	-0.8
FNOR	12	V	500	12	0	0	4.0	1.2	1.7
FNOU	00	V	500	10	0	0	3.1	-0.1	0.9
FNOU	12	V	500	10	0	0	2.8	0.2	1.7
FNPH	00	V	500	14	0	0	2.0	-0.2	1.1
FNPH	12	V	500	12	0	0	2.3	0.7	0.6
FNRS	00	V	500	9	0	0	3.7	-0.5	0.5
FNRS	12	V	500	9	0	0	3.7	-1.5	-1.2
JBOA	00	V	500	1	0	0	3.7	-0.1	-0.1
JGQH	00	V	500	1	0	0	3.7	-0.4	0.7
LDWR	00	V	500	30	0	0	2.9	0.3	-0.5
LDWR	12	V	500	25	0	0	3.8	0.6	0.8
OVYA2	00	V	500	9	0	0	2.9	-0.6	1.9
OVYA2	12	V	500	12	0	0	2.9	0.9	1.1
OXYH2	00	V	500	15	0	13	4.8	-0.9	-1.6
OXYH2	12	V	500	18	0	16	9.6	-1.6	-2.3
S6LA	00	V	500	1	0	0	8.5	-3.6	-2.7
S6LA	12	V	500	1	0	0	8.5	1.1	1.5
VJJF	00	V	500	1	0	0	8.5	-1.2	-0.2
VNAA	00	V	500	1	0	0	2.5	-0.1	7.0
V2XM	00	V	500	2	0	0	2.5	-2.8	0.0
V2XM	12	V	500	3	0	0	2.5	-2.4	-0.1
WTEC	00	V	500	1	0	0	2.5	3.6	-0.8
ZCBP6	00	V	500	3	0	0	2.5	4.8	2.8
ZCBP6	12	V	500	2	0	0	2.5	-4.2	0.2
03953	00	V	500	30	0	0	3.4	0.2	0.0
03953	12	V	500	27	0	0	3.2	0.4	0.0
04018	00	V	500	29	0	0	3.2	0.8	-0.2
04018	12	V	500	28	0	0	3.4	-0.5	-0.7
04220	00	V	500	27	0	0	2.0	-0.4	0.0
04220	12	V	500	23	0	0	3.5	1.9	1.1
04270	00	V	500	27	0	0	3.6	-1.0	-1.1
04270	12	V	500	27	0	0	3.0	-0.1	-0.4
04339	00	V	500	26	0	0	3.5	2.5	-0.3
04339	12	V	500	29	0	0	5.0	0.3	-1.0
04360	00	V	500	30	0	3	3.5	0.6	-0.5
04360	12	V	500	29	0	0	3.9	-0.8	-0.1
08001	00	V	500	28	0	0	3.8	-0.2	-1.6
08001	12	V	500	13	0	0	4.0	0.3	0.9
08508	00	V	500	1	0	0	2.8	0.1	-1.3
08508	12	V	500	23	0	0	2.8	0.9	0.2
08594	00	V	500	26	0	57	2.9	-0.9	-1.2
08594	12	V	500	25	0	56	2.6	-0.8	-1.2
60020	00	V	500	19	0	0	2.6	0.4	0.9
60020	12	V	500	18	0	0	3.0	-0.2	1.0
71600	00	V	500	29	0	0	2.3	0.1	-0.2
71600	12	V	500	28	0	0	2.2	-0.2	0.1
72201	00	V	500	29	0	44	4.2	0.2	-1.2
72201	12	V	500	27	0	48	2.3	1.1	0.3
72402	00	V	500	27	0	0	2.3	0.0	-0.8
72402	12	V	500	29	0	0	3.4	-0.1	0.0
74494	00	V	500	26	0	0	2.5	-0.1	0.4
74494	12	V	500	29	0	0	2.2	-0.2	0.3
78016	00	V	500	27	0	0	2.6	0.2	-0.4
78016	12	V	500	25	0	0	4.4	-0.1	-0.5

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45